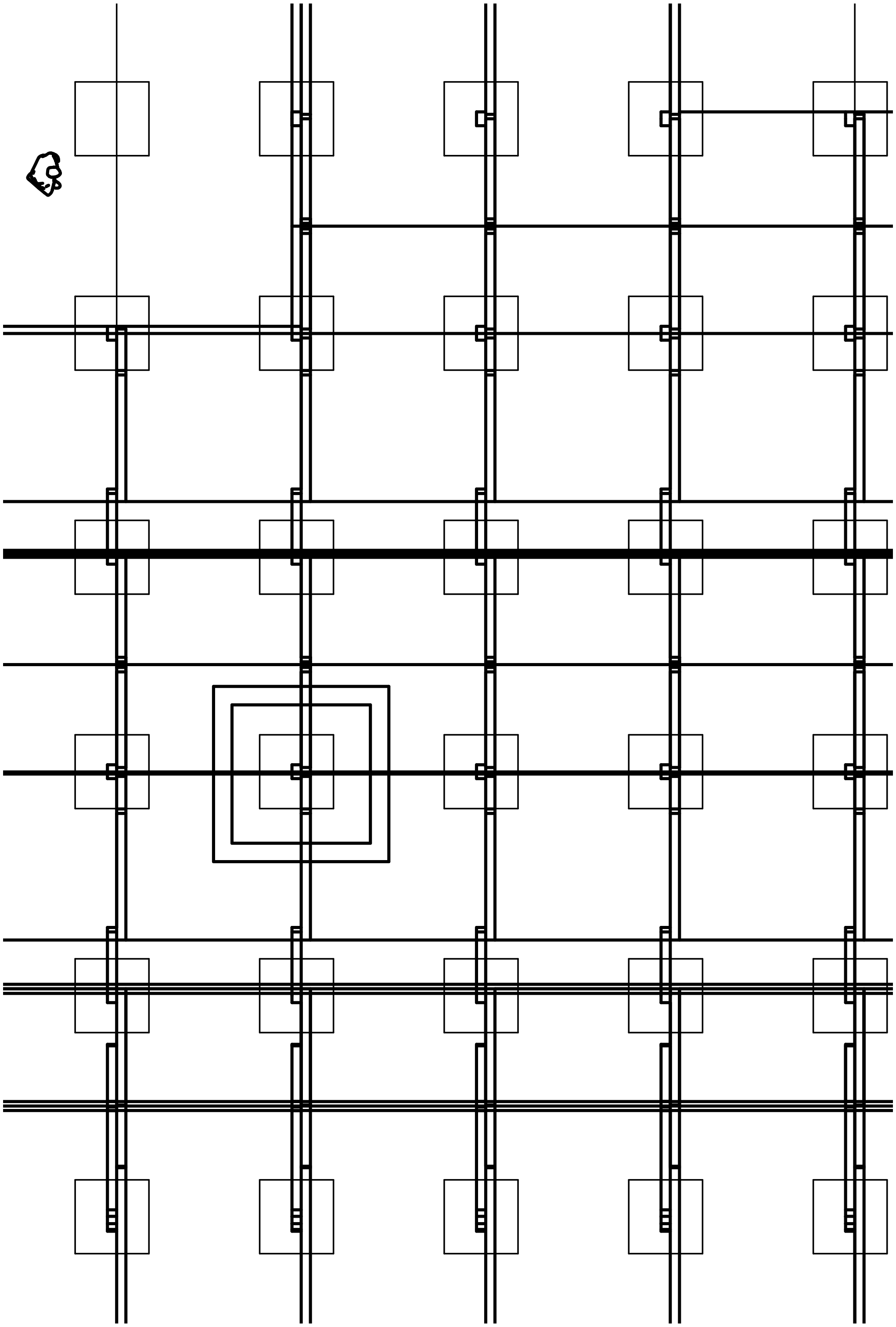
PoRTFoLIo



daniel a castro

georgia institute of technology
fall22

cover: preliminary floor plan of the mayersville
community center. final version shown on page 58.

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rekindling the core 44

recreating krause 64

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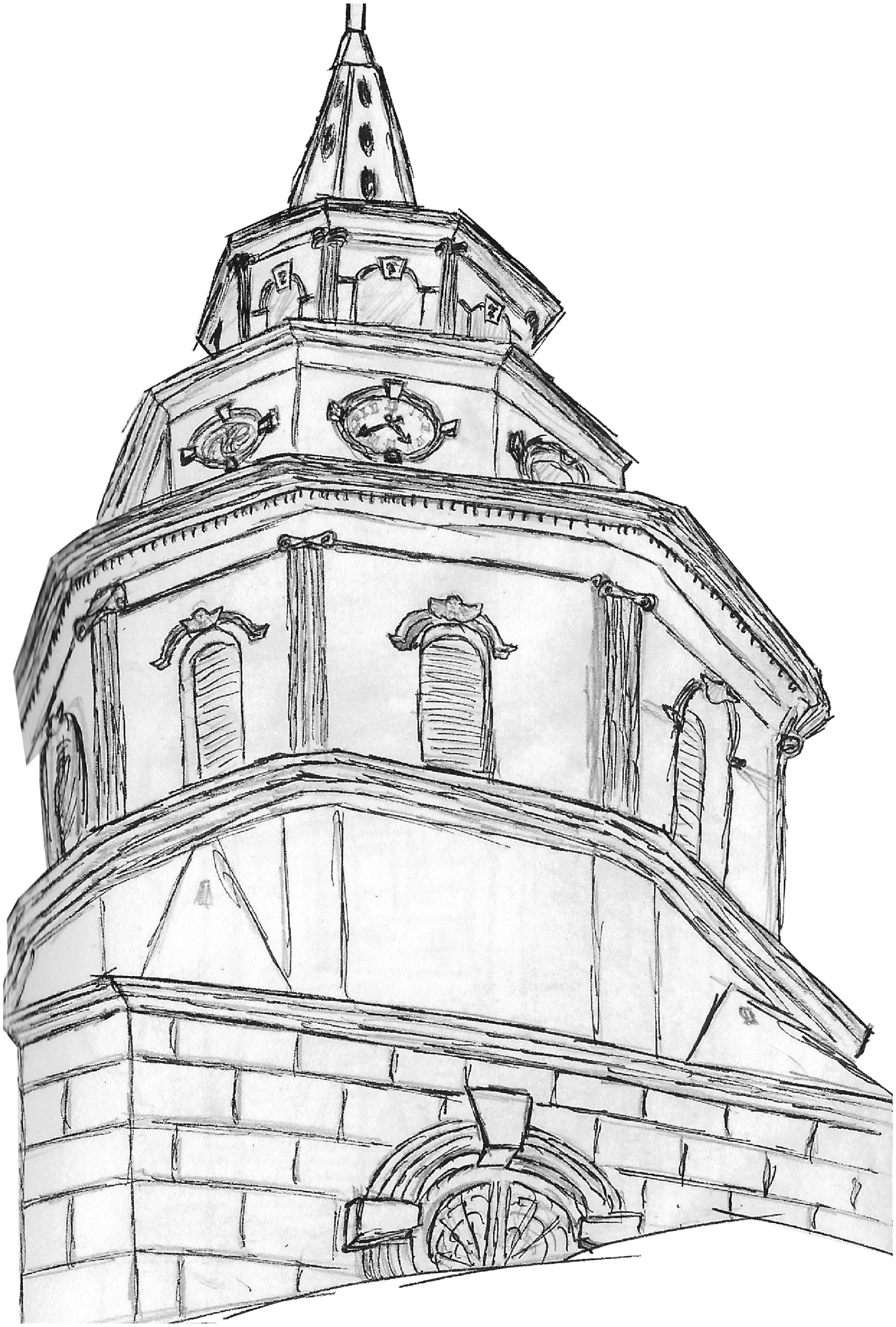
right: st. philip's church (charleston) on 7 september 2020. (pen and pencil)



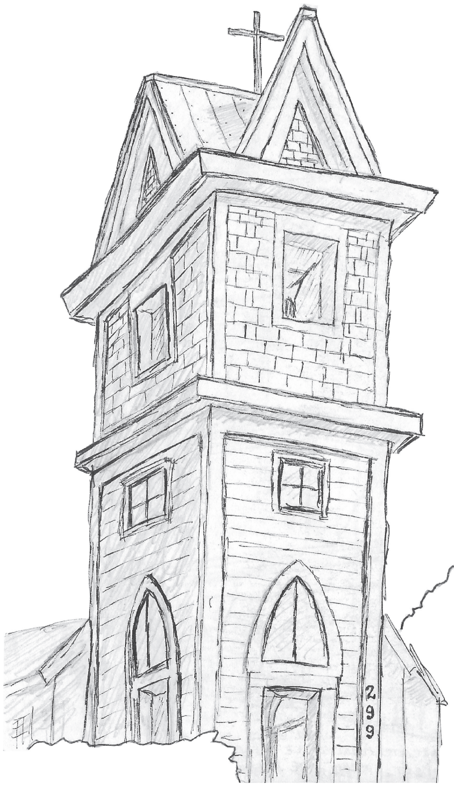
charleston, sc

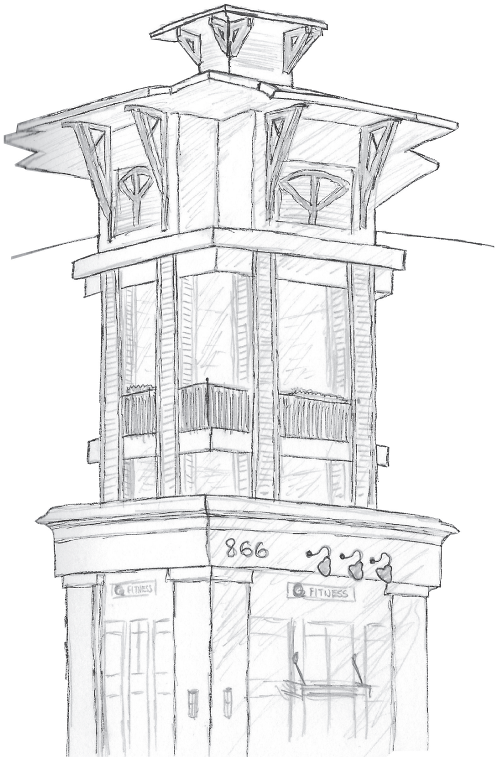
this assignment sought to entice students out of a pandemic-induced hibernation into their local environment through developing a collection of hand-drawn sketches of what they saw in built form. "the holy city" provided a perfect opportunity to explore a rich diversity of architectural forms, including georgian churches in the historic center, iconic charleston single rowhouses, and modern developments on daniel and james island.

charleston sketched

a survey of the built environment

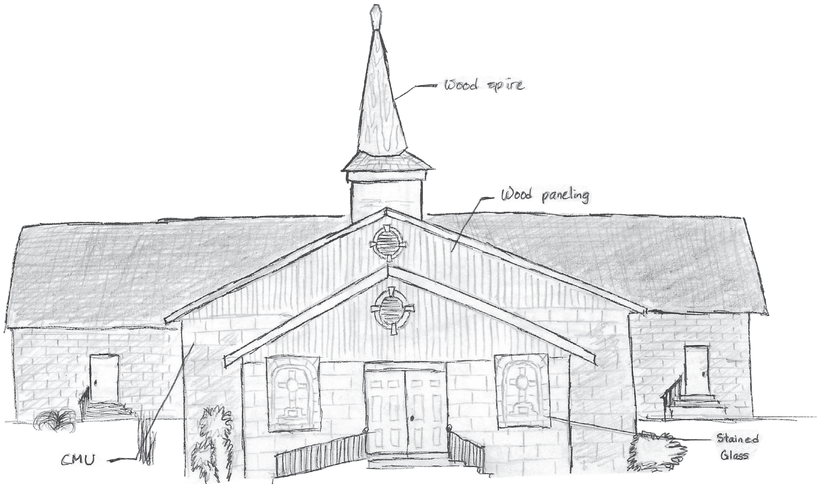
arch6229: construction tech 1
professor charles rudolph
fall 2020



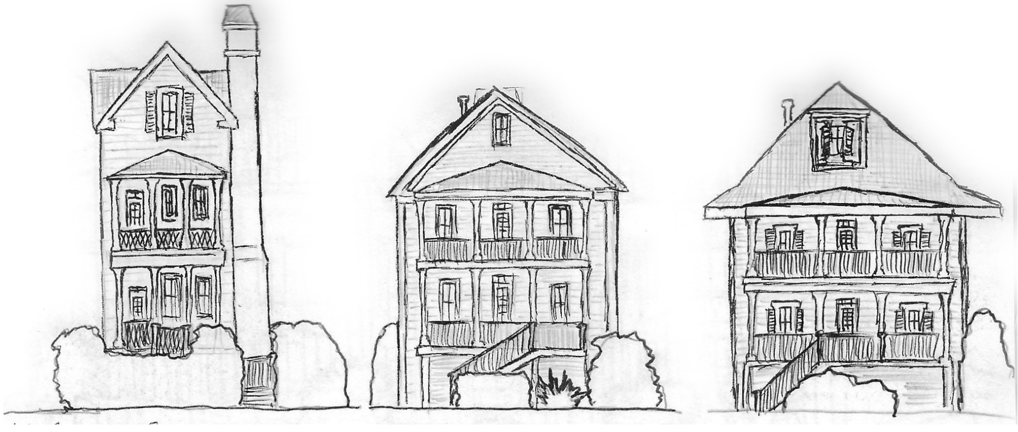

866
FITNESS
FITNESS

left: church of the holy cross (daniel island) on 14 september 2020. (pen and pencil)

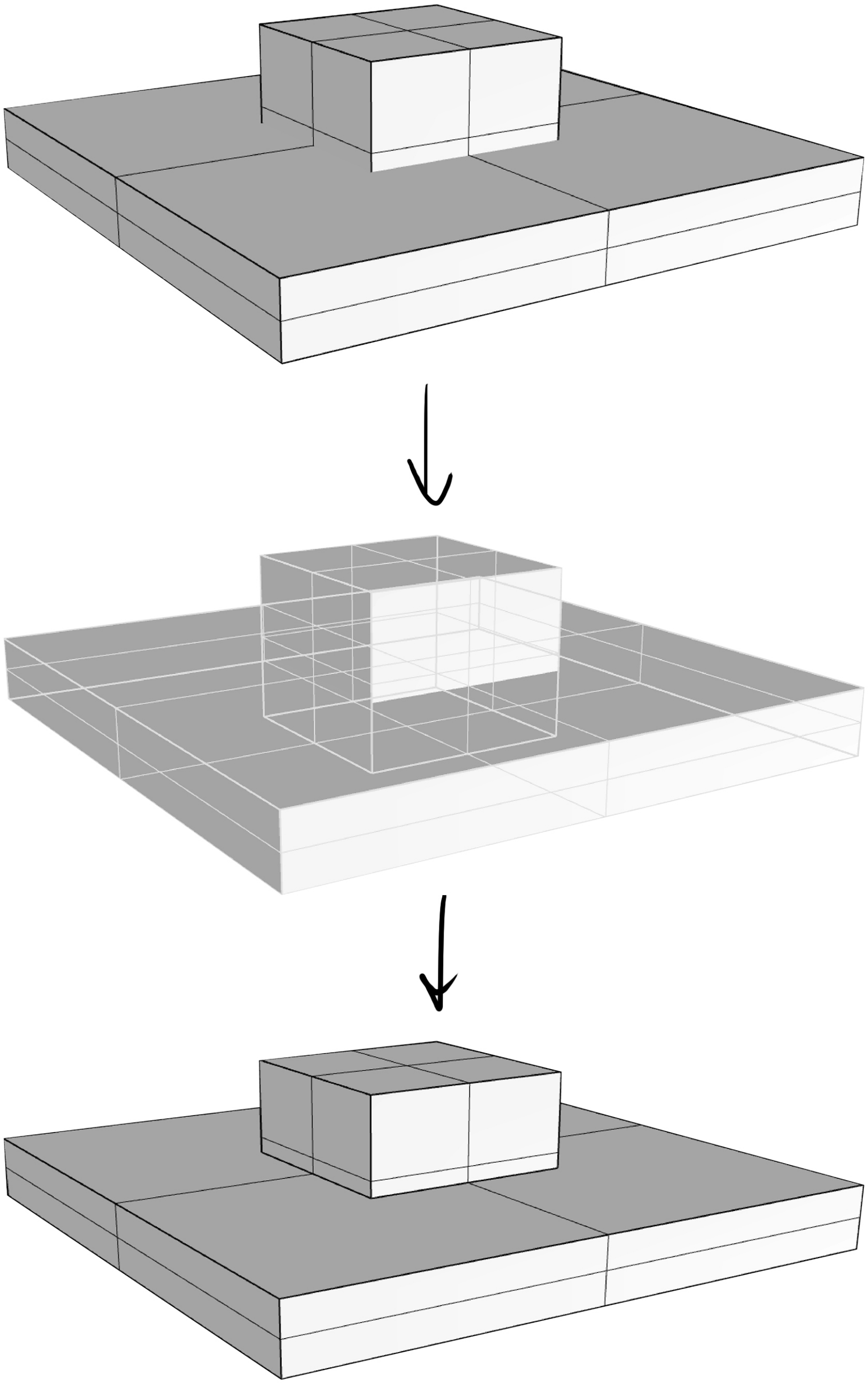
right: central island square (daniel island) on 9 november 2020. (pen and pencil)


Wood spire
Wood paneling
CMU
Stained Glass

left: st. james a.m.e. church (thomas island) on 5 october 2020. (pen and pencil)



left: 116, 114, 112 curran street (daniel island) on 12 october 2020. (pen and pencil) *right*: union operation



pozano, italy

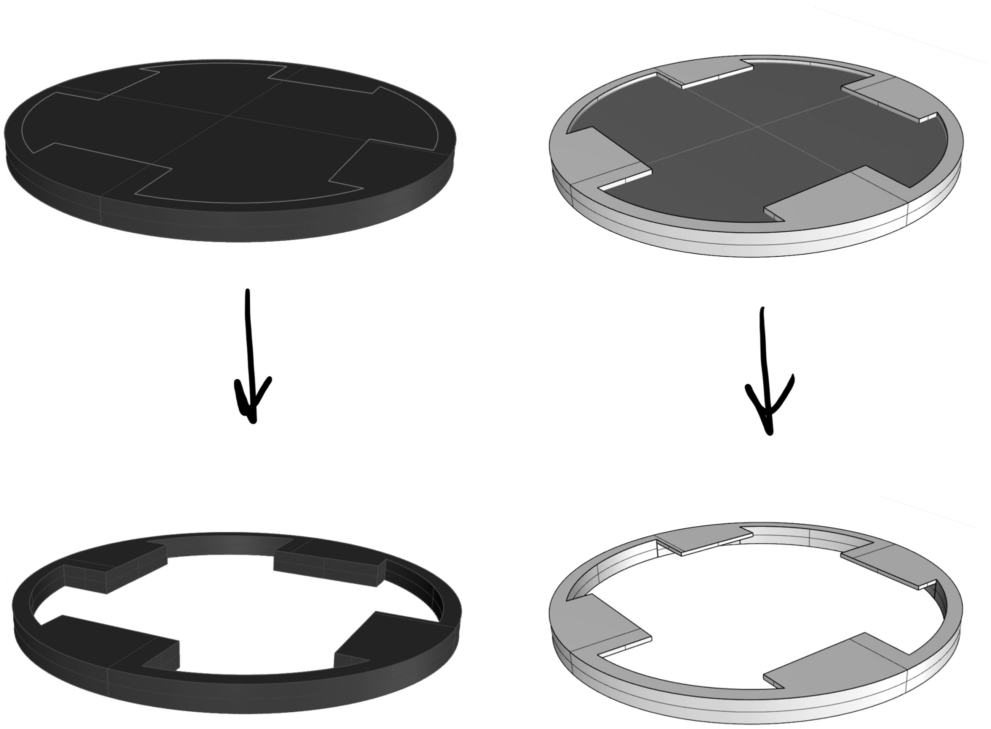
this exploration sought to understand the basic actions at play in the design development of alberto campo baeza's benneton nursery. the vocabulary of the design is enunciated through basic rhino commands, which serve as building blocks for a simple yet elegant design.

design modes

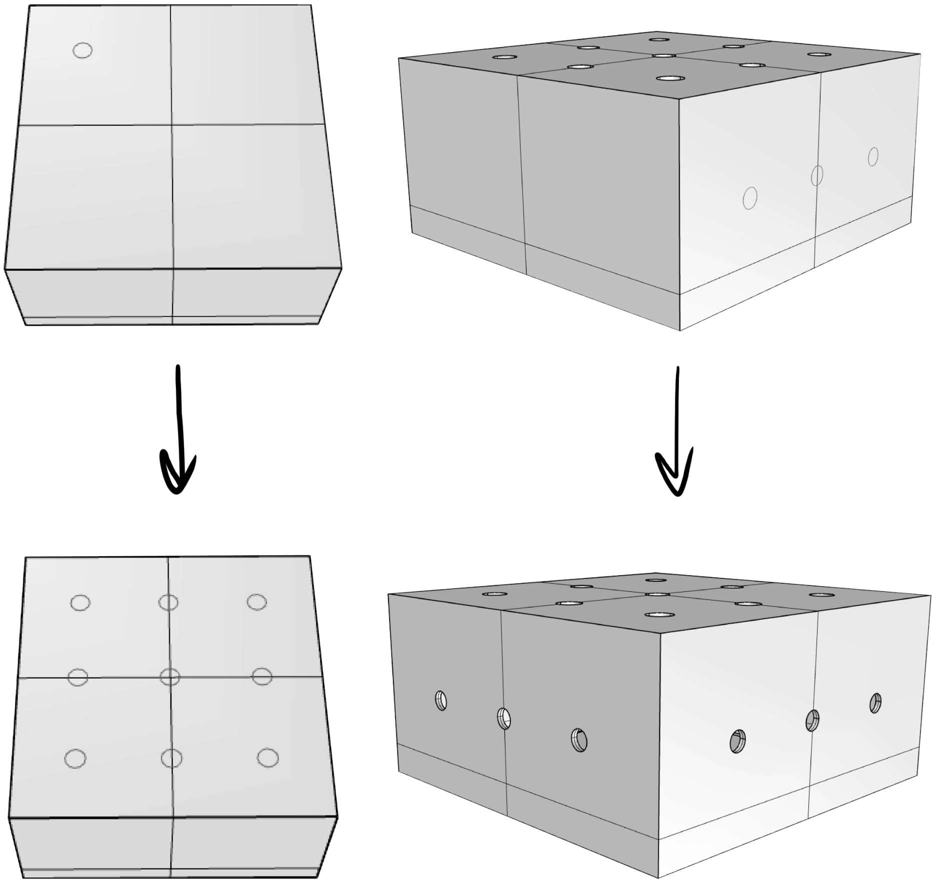
benneton nursery

arch6010: media + modeling 1
professor harris dimitropoulos
fall 2020

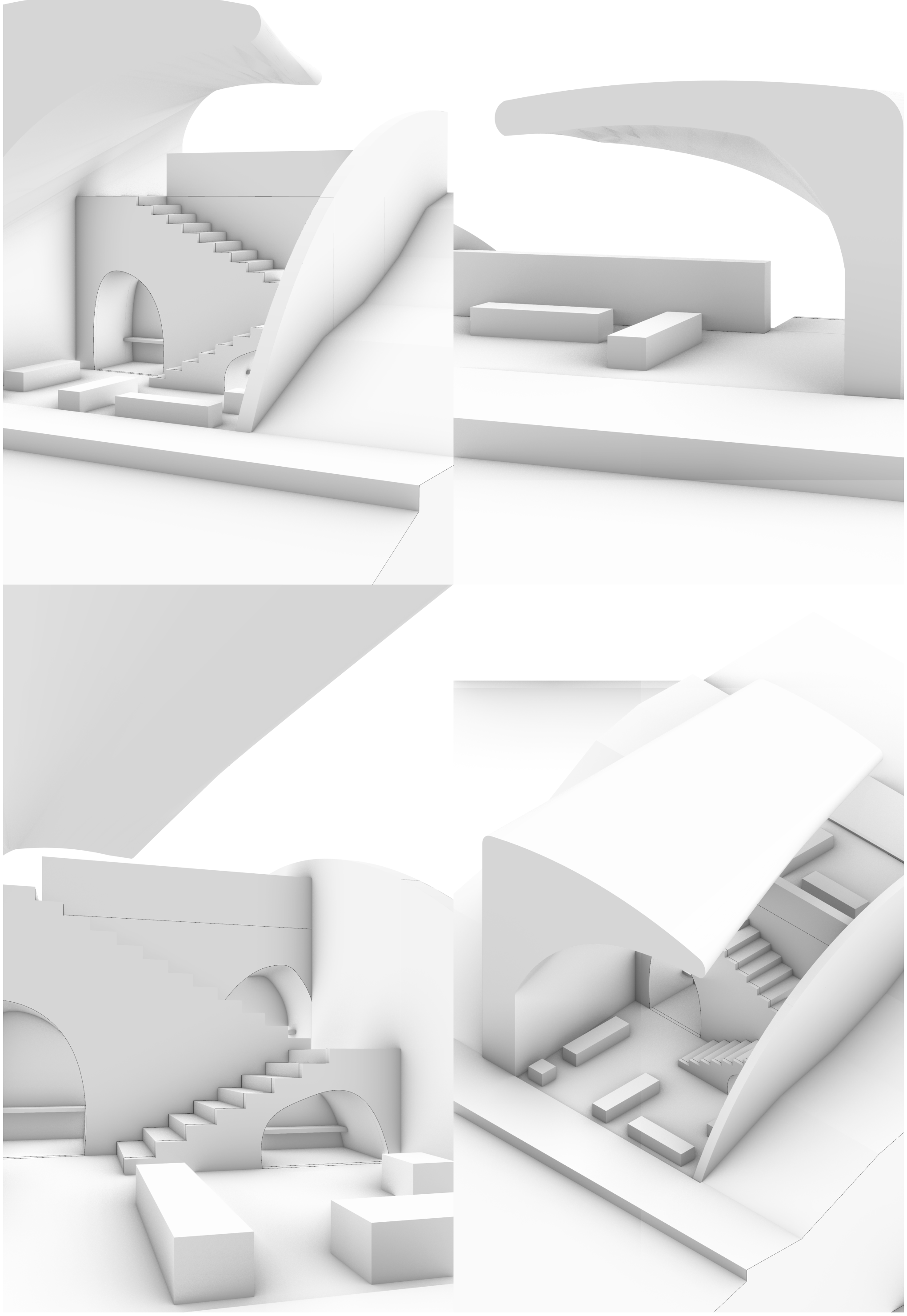
top: boolean difference operation



bottom: array operation



right: perspective snapshots



common in parks, pavilions are a center of relaxation and community within a natural landscape. this pavilion project explores another function of this building typology: connection. situated on a slope between two pathways, this park pavilion aims to serve as a link, a hub, and a focal point through its utilization of precast concrete forms and its carved out cave-like appearance.

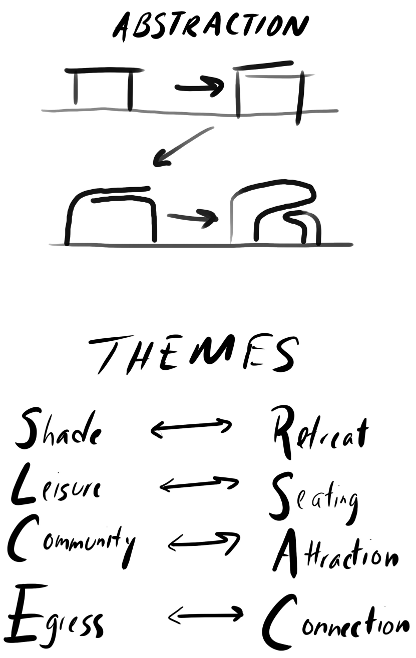
park pavilion

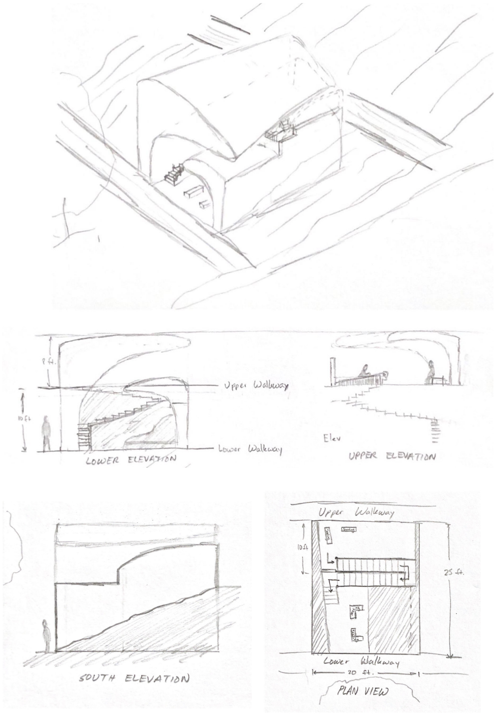
carved of stone

arch6229: construction tech 1
professor charles rudolph
fall 2020

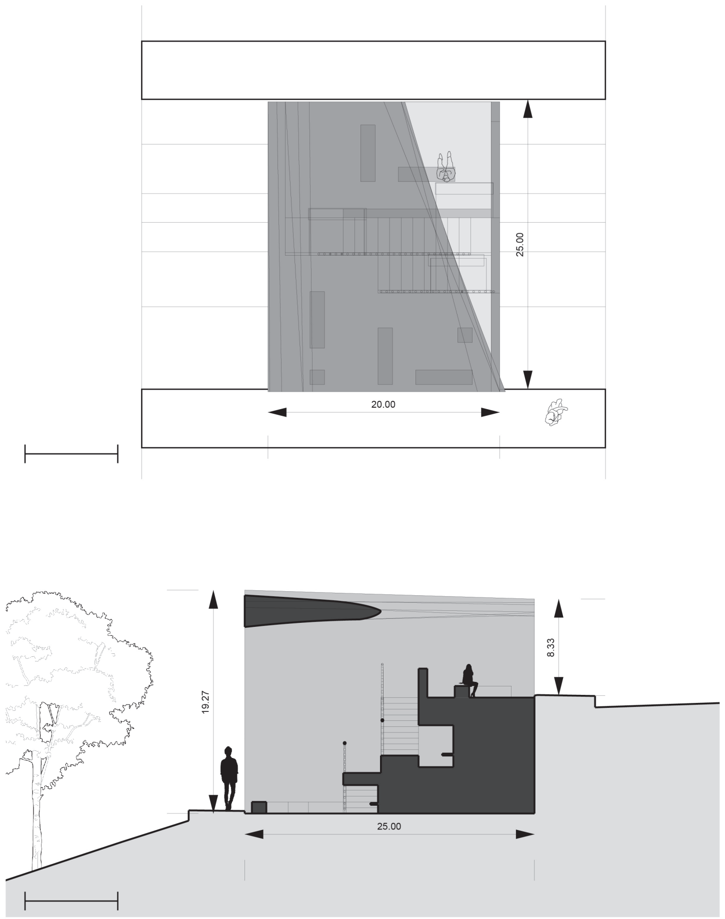
left: initial abstraction and guiding themes diagram.

right: initial concept sketches showing a perspective 3d view, west elevation, east elevation, south elevation, and plan view.

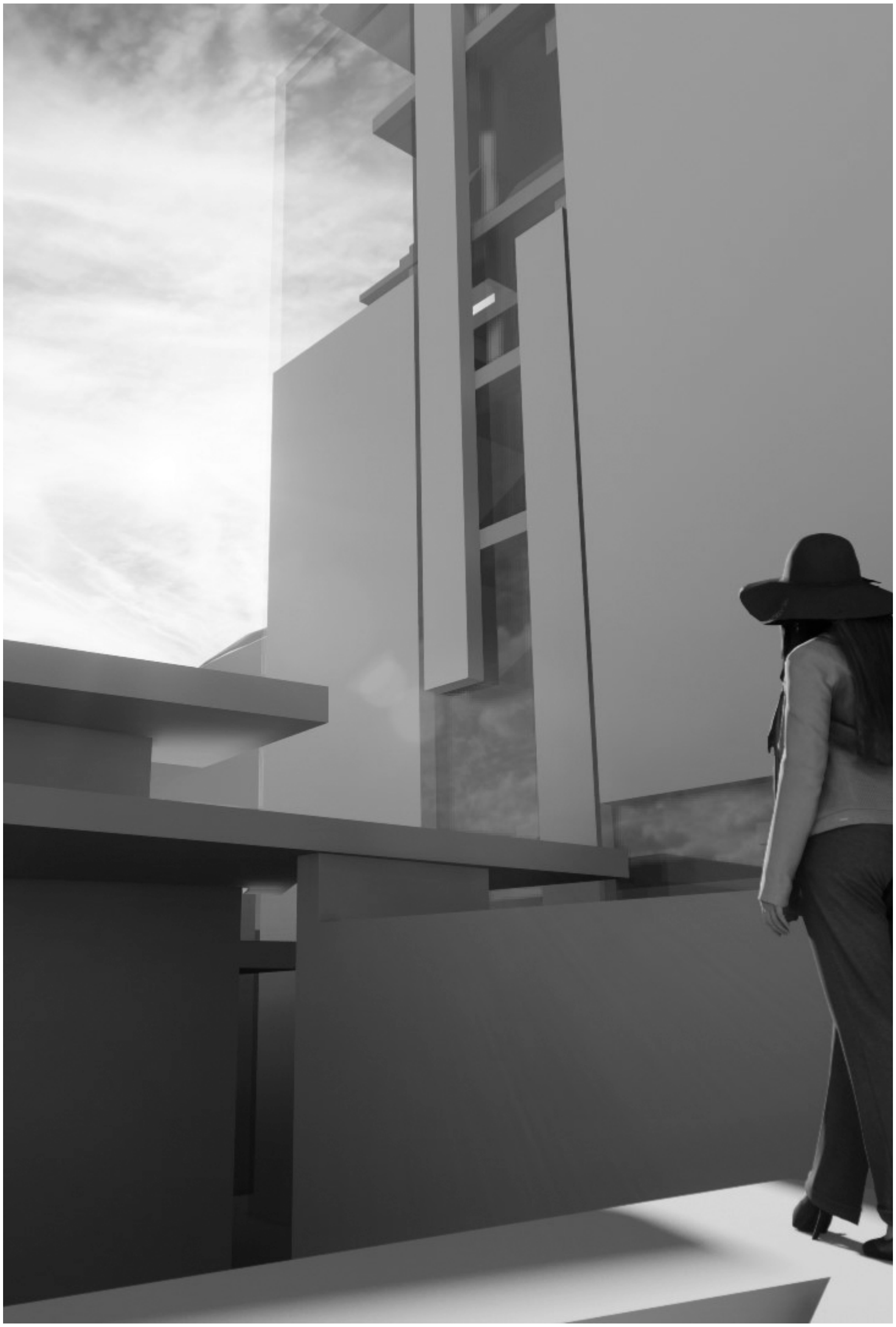

ABSTRACTION
THEMES
Shade ⟷ Retreat
Leisure ⟷ Seating
Community ⟷ Attraction
Egress ⟷ Connection


8 ft
10 ft
Upper Walkway
Lower Walkway
LOWER ELEVATION
Elev
UPPER ELEVATION
SOUTH ELEVATION
Upper Walkway
10 ft
25 ft.
Lower Walkway
20 ft.
PLAN VIEW

left: site view (top) and section view (bottom) originally drawn at 1/8”=1’ scale.


25.00
20.00
19.27
8.33
25.00

right: final render, with a view from the cubist landscape.



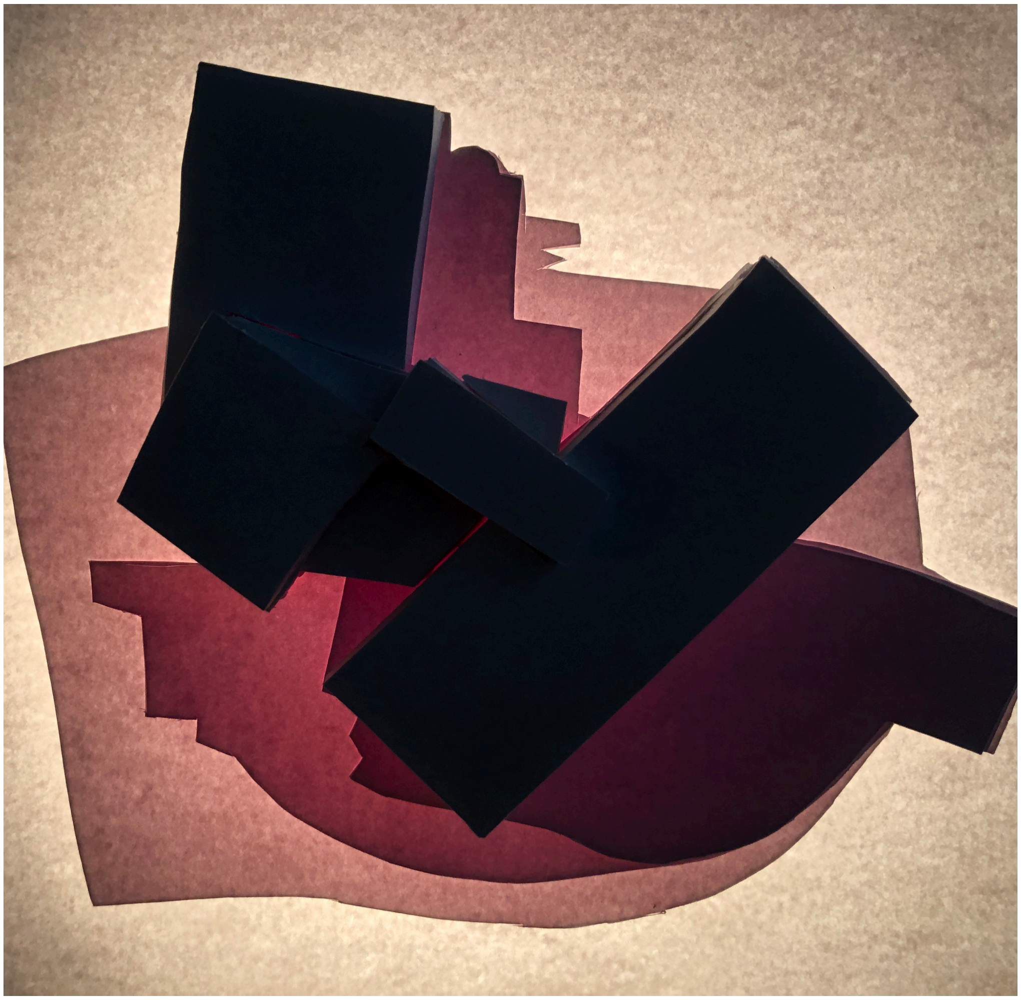
cala llonga, ibiza, spain

this project began with the development of a cubist landscape, drawing from the forms of georges braque's "still life with gillette". next, a corner park was developed utilizing a predetermined kit of parts. the corner park was then rotated vertically and geometries were extruded to create a vertical structure. this structure was then placed into the previously constructed cubist landscape and programmed to be the house of an electronic dj.

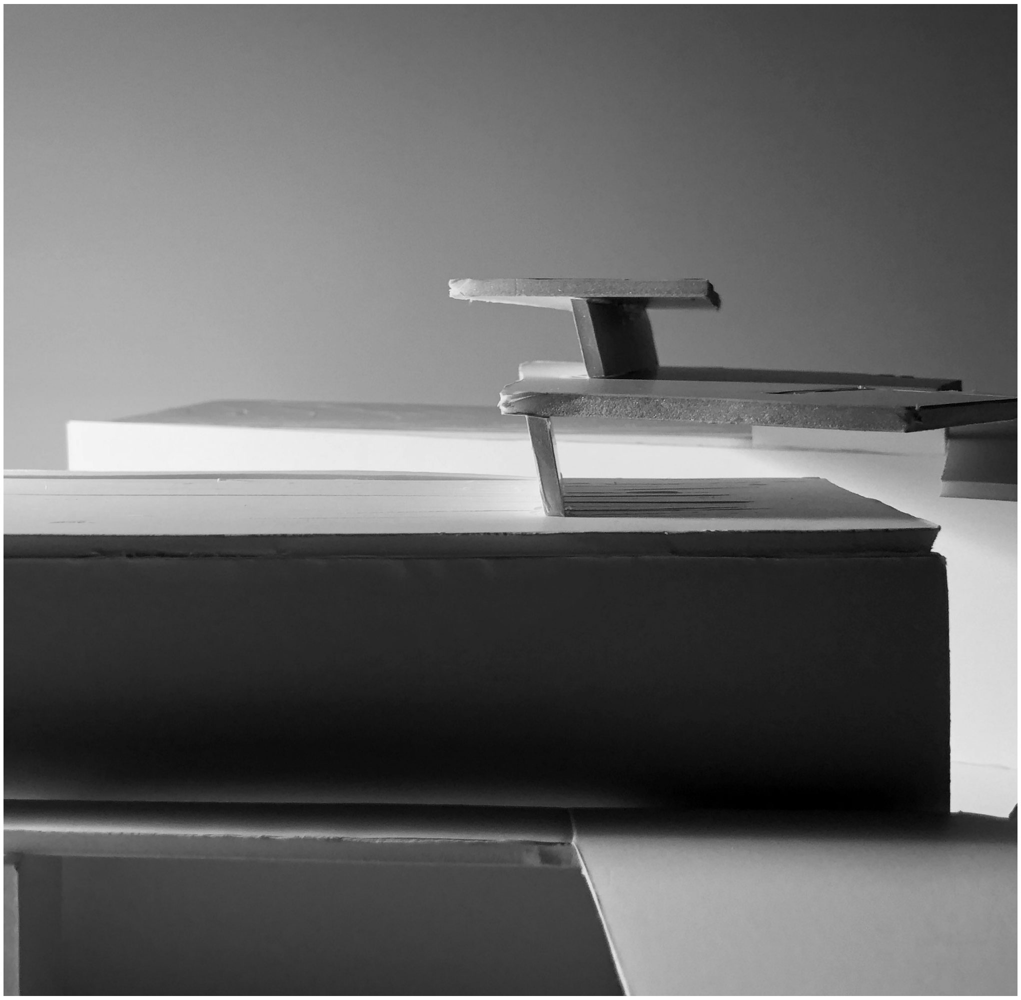
musician's house

raising the cubist landscape

arch6028: core studio 1
professor charles rudolph
fall 2020

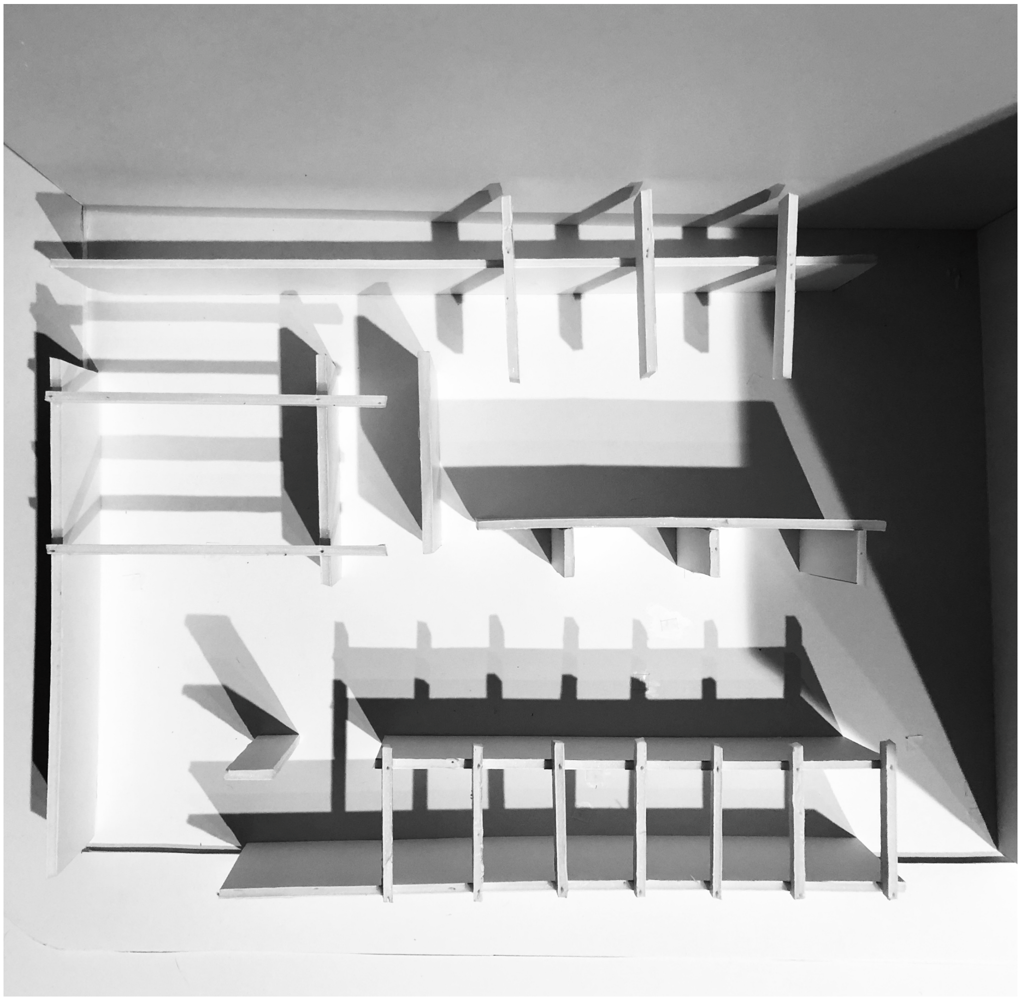


top: a backlit light analysis of first study model of the cubist landscape, made with bristol paper with foamcore.

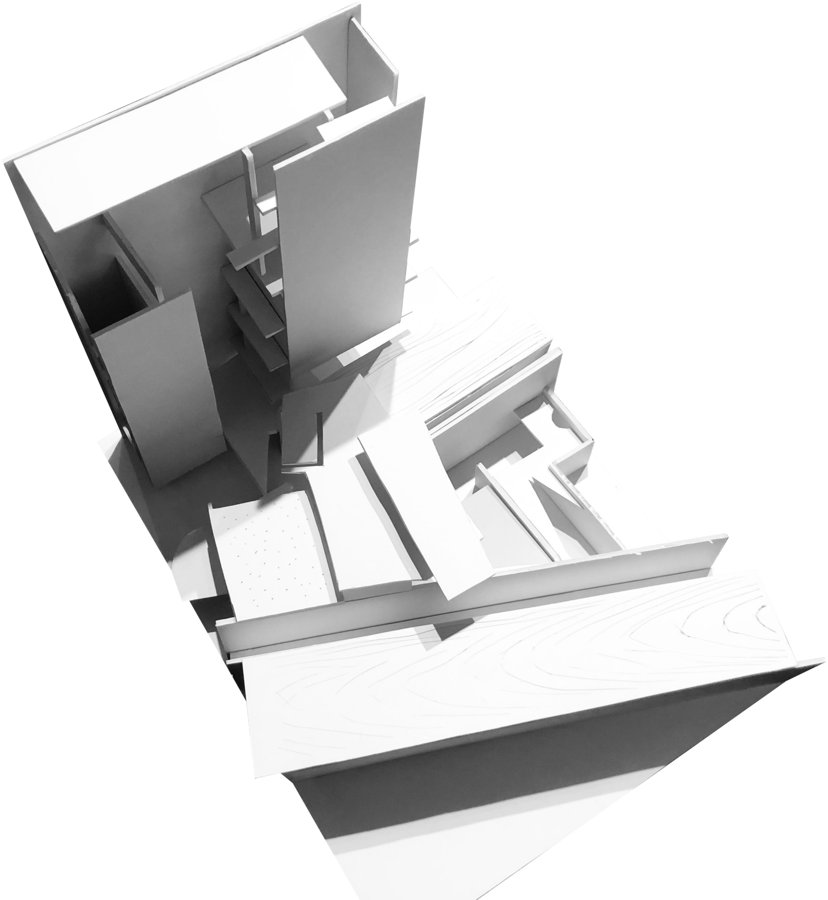


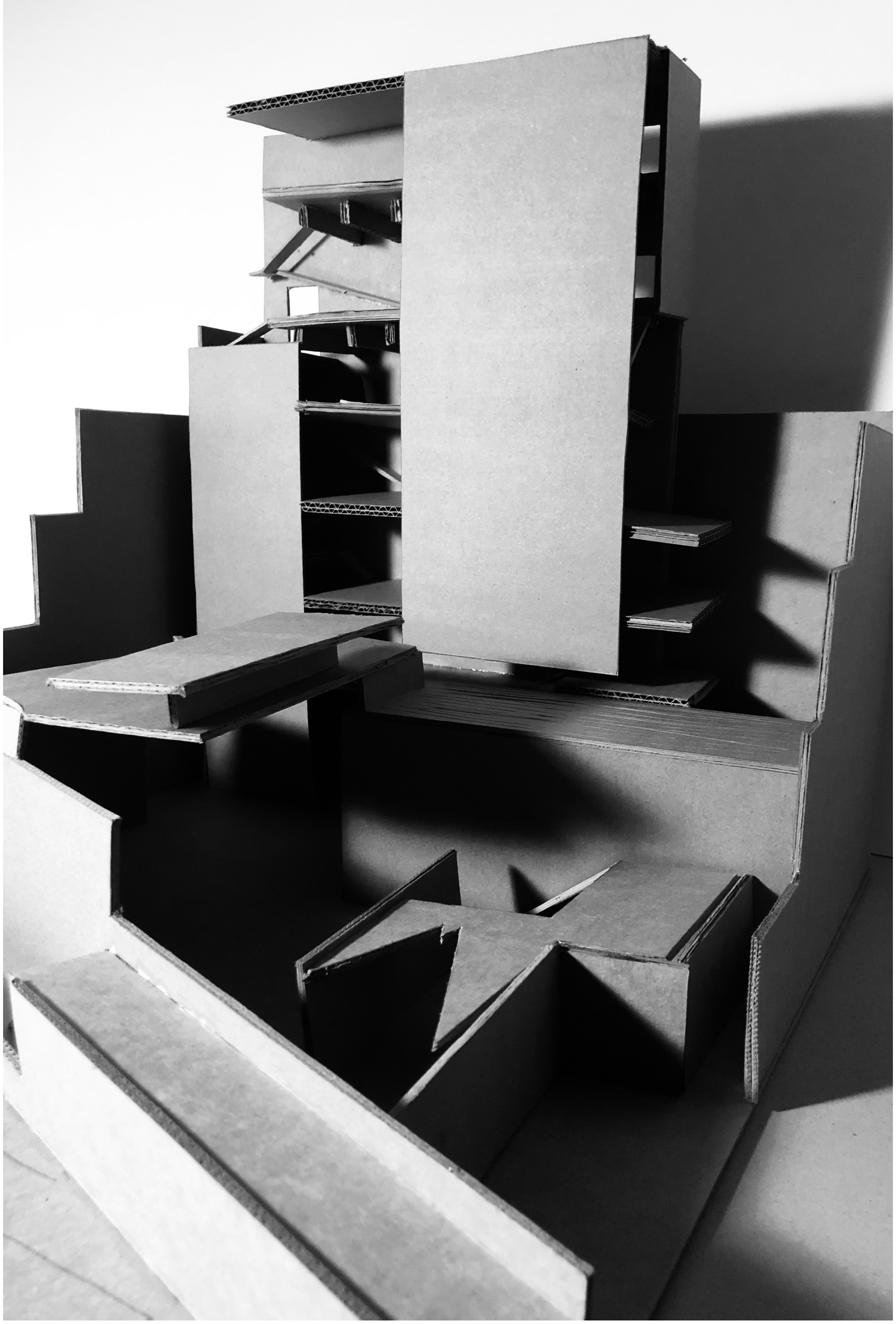
bottom: the final physical model of the cubist landscape sought to fully explore the spaces between forms, rather than the forms themselves. the layered hierarchy of braque's shapes dictated the elevation at which they were placed.

top: the exposed skeleton of the corner park, demonstrating shading possibilities.



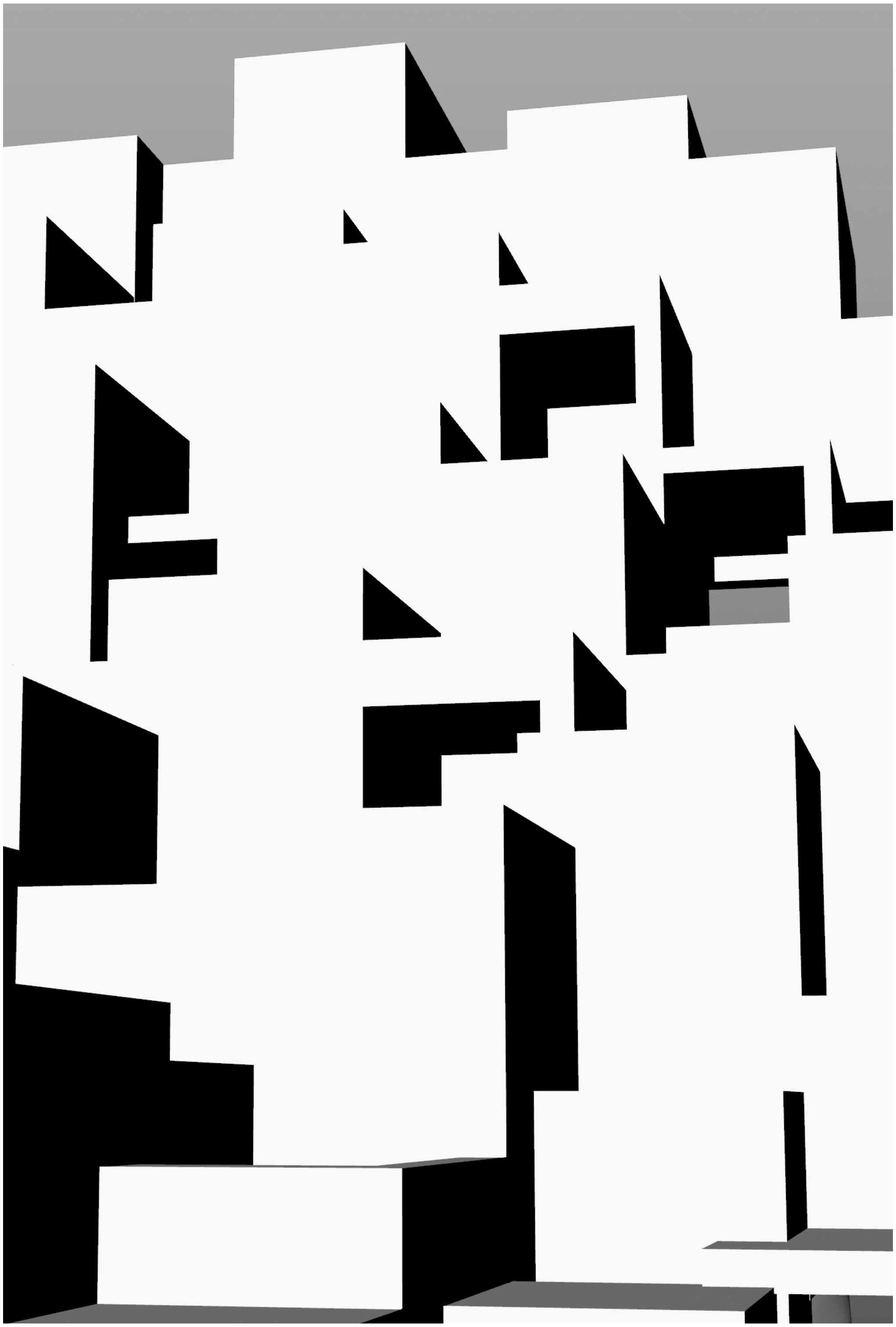
bottom: integration of the corner park model into the cubist landscape model to produce the musician's house.





left: final study model of the musician’s house.

right: a perspective photo of variation 608.



piedmont park, atlanta, ga

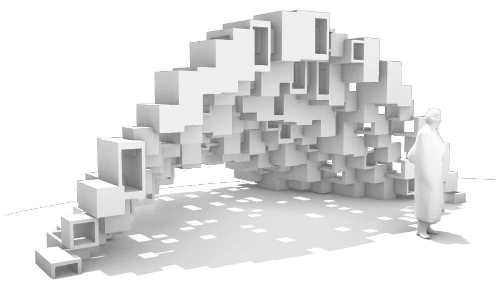
this parametric design begins with a parabolic surface, which is then scaled and gridded. the nodes created by this gridded surface then act as anchor points for nine different volumes with two different orientations, resulting in eighteen total cubic volumes. one of these volumes is then randomly placed at each node, creating an infinite amount of possibilities of this cubic design.

cubic bandshell

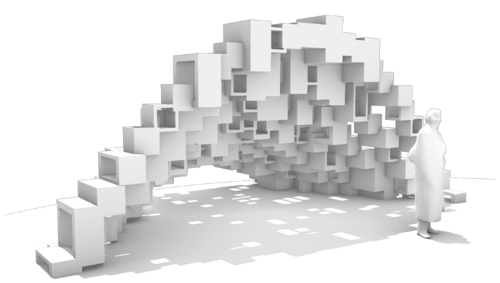
parameterizing the concrete bandshell

arch8833: concrete workshop - parametric precast 1
professor tristan al-haddad
spring 2021

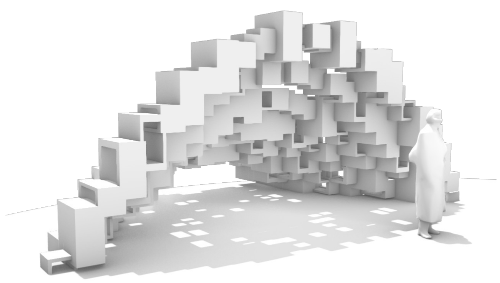
variation 1



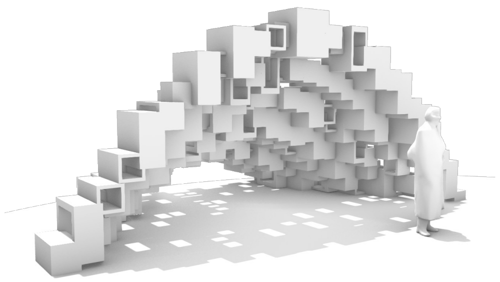
variation 43



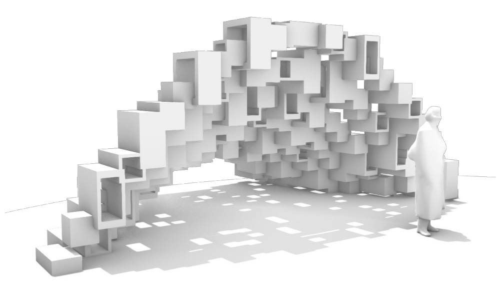
variation 106



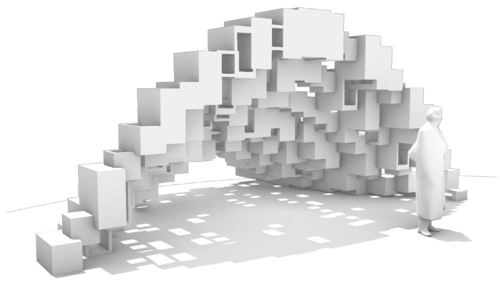
variation 186



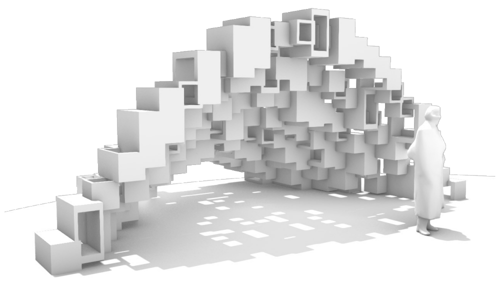
variation 224



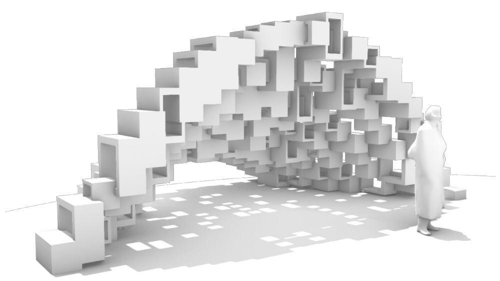
variation 255



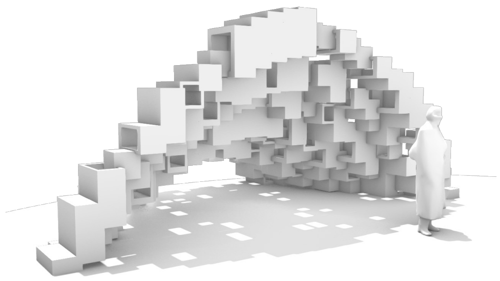
variation 387



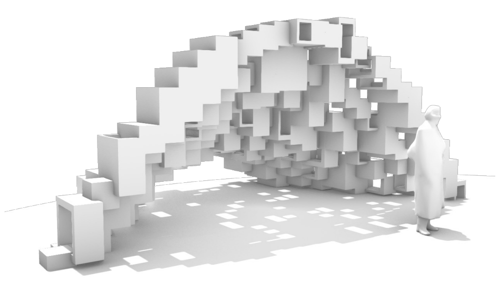
variation 452



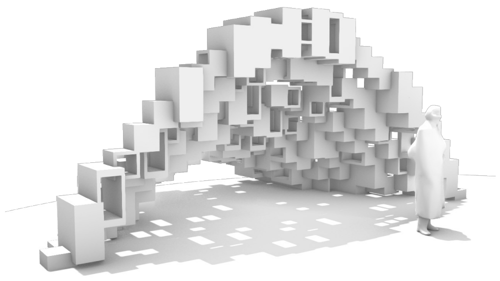
variation 515



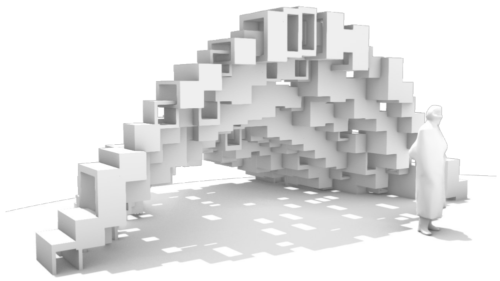
variation 595



variation 621

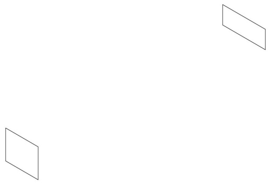


variation 763



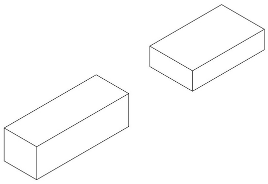
Step-by-Step

1. two planes



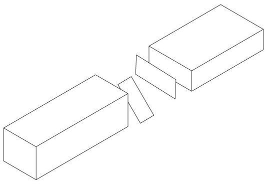
Two planes are initialized and centered with each other. The length of the structure, width of each plane and height of each plane is paramaterized. Additionally, the height differential between the two planes can be adjusted.

2. extrude



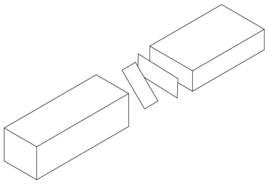
The two planes are then extruded to form the rectilinear zones of the structure. The length of each zones is paramaterized.

3. establish key frames



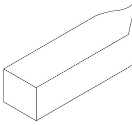
Key frames are established by offsetting the two planes and the end of each extrusion and then rotating. The dimensions of these key frames, their distances in relation to each other, and their rotation angles are parameterized.

4. centering key frames



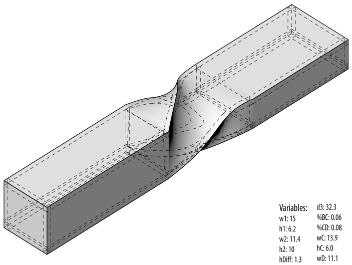
These frames are then moved to intersect with an axis linking the centroids of the extrusion planes. The intersecting geometries are then moved to align their centroids along this axis to center the geometries.

5. loft



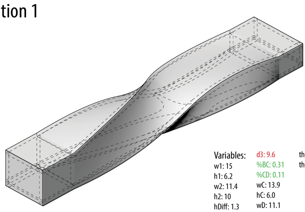
These planes are then lofted to

Original



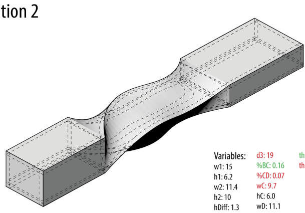
Variables:
w1: 15
h1: 6.2
w2: 11.4
h2: 10
hDiff: 1.3
d1: 25.2
d3: 32.3
%BC: 0.06
%CD: 0.08
wC: 13.9
hC: 6.0
wD: 11.1
hD: 6.7
thetaC: 2.3
thetaD: 44.6

Variation 1



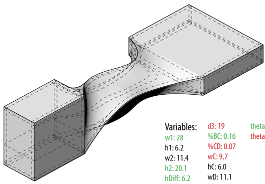
Variables:
w1: 15
h1: 6.2
w2: 11.4
h2: 10
hDiff: 1.3
d1: 7.4
d3: 9.6
%BC: 0.31
%CD: 0.11
wC: 13.9
hC: 6.0
wD: 11.1
hD: 6.7
thetaC: 2.3
thetaD: 44.6

Variation 2



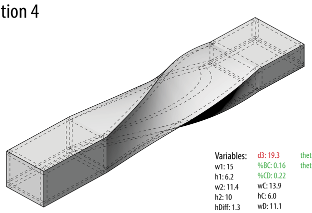
Variables:
w1: 15
h1: 6.2
w2: 11.4
h2: 10
hDiff: 1.3
d1: 22.7
d3: 19
%BC: 0.16
%CD: 0.07
wC: 9.7
hC: 6.0
wD: 11.1
hD: 6.7
thetaC: 31.44
thetaD: 20.8

Variation 3



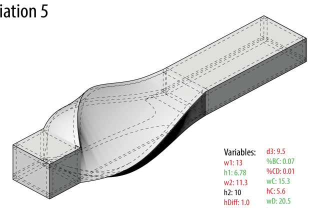
Variables:
w1: 28
h1: 6.2
w2: 11.4
h2: 20.1
hDiff: 6.2
d1: 22.7
d3: 19
%BC: 0.16
%CD: 0.07
wC: 9.7
hC: 6.0
wD: 11.1
hD: 6.7
thetaC: 31.44
thetaD: 20.8

Variation 4



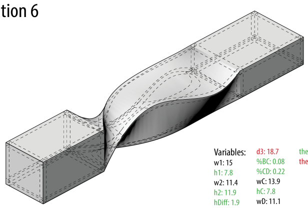
Variables:
w1: 15
h1: 6.2
w2: 11.4
h2: 10
hDiff: 1.3
d1: 13.9
d3: 19.3
%BC: 0.16
%CD: 0.22
wC: 13.9
hC: 6.0
wD: 11.1
hD: 7.0
thetaC: 23.9
thetaD: 72.8

Variation 5



Variables:
w1: 13
h1: 6.78
w2: 11.3
h2: 10
hDiff: 1.0
d1: 31.0
d3: 9.5
%BC: 0.07
%CD: 0.01
wC: 15.3
hC: 5.6
wD: 20.5
hD: 7.0
thetaC: 1.7
thetaD: 34.3

Variation 6



Variables:
w1: 15
h1: 7.8
w2: 11.4
h2: 11.9
hDiff: 1.9
d1: 19.5
d3: 18.7
%BC: 0.08
%CD: 0.22
wC: 13.9
hC: 7.8
wD: 11.1
hD: 10
thetaC: 19
thetaD: 0

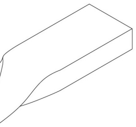
jevnaker, norway

in order to understand the capabilities of parameterization in design, bjarke ingels group's the twist was broken down into three distinct systems: massing, structure, and cladding. after an analysis of its tripartite organization and its twisting geometry, the three systems were each parameterized in grasshopper and interwoven together in order to develop six distinct variations. these variations employ the ruleset established in the twist to derive limitless spatial possibilities in a reimagining of bjarke ingels group's original design.

parameterizing the twist

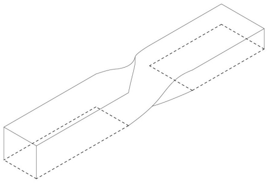
unraveling bjarke ingels group's norwegian marvel

arch6020: media + modeling 2
professor james park
spring 2021



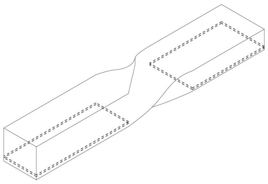
create the central twist.

6. base planes



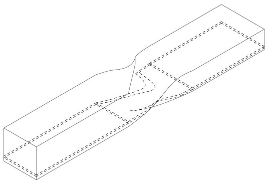
The base planes of the rectilinear sections of the structure are identified.

7. offset and extrude



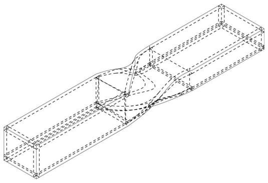
These base planes are subsequently offset and extruded. The offset and extrusion distances are all paramaterized.

8. loft and trim

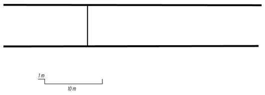


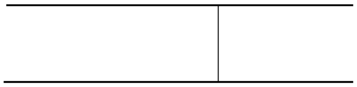
The end planes of the two extrusions are identified, corrected, and lofted. This loft is then trimmed to accomodate the shape of the twist.

9. wall offset

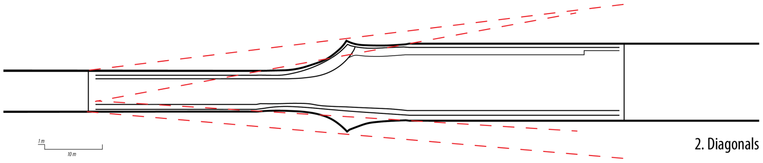


Finally, the walls are offset from the exterior massing of the structure. This offset distance is paramaterized.

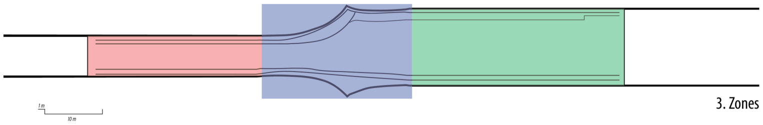




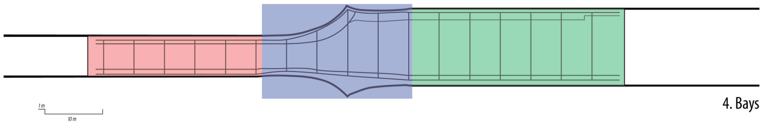
1. Extensions



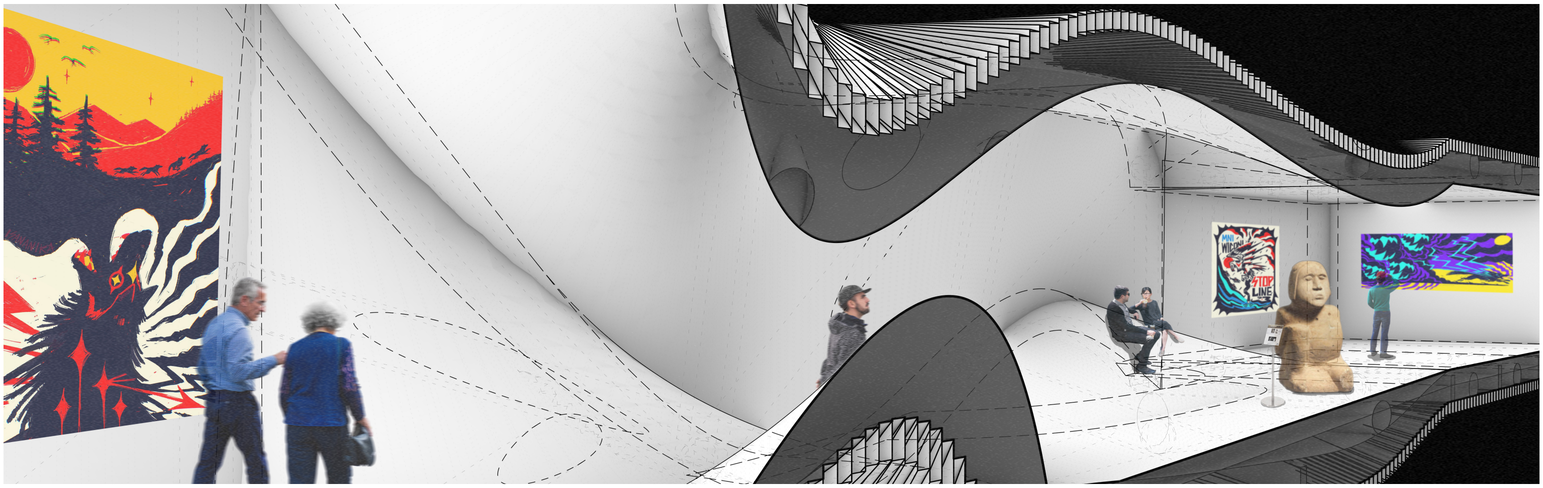
2. Diagonals



3. Zones



4. Bays



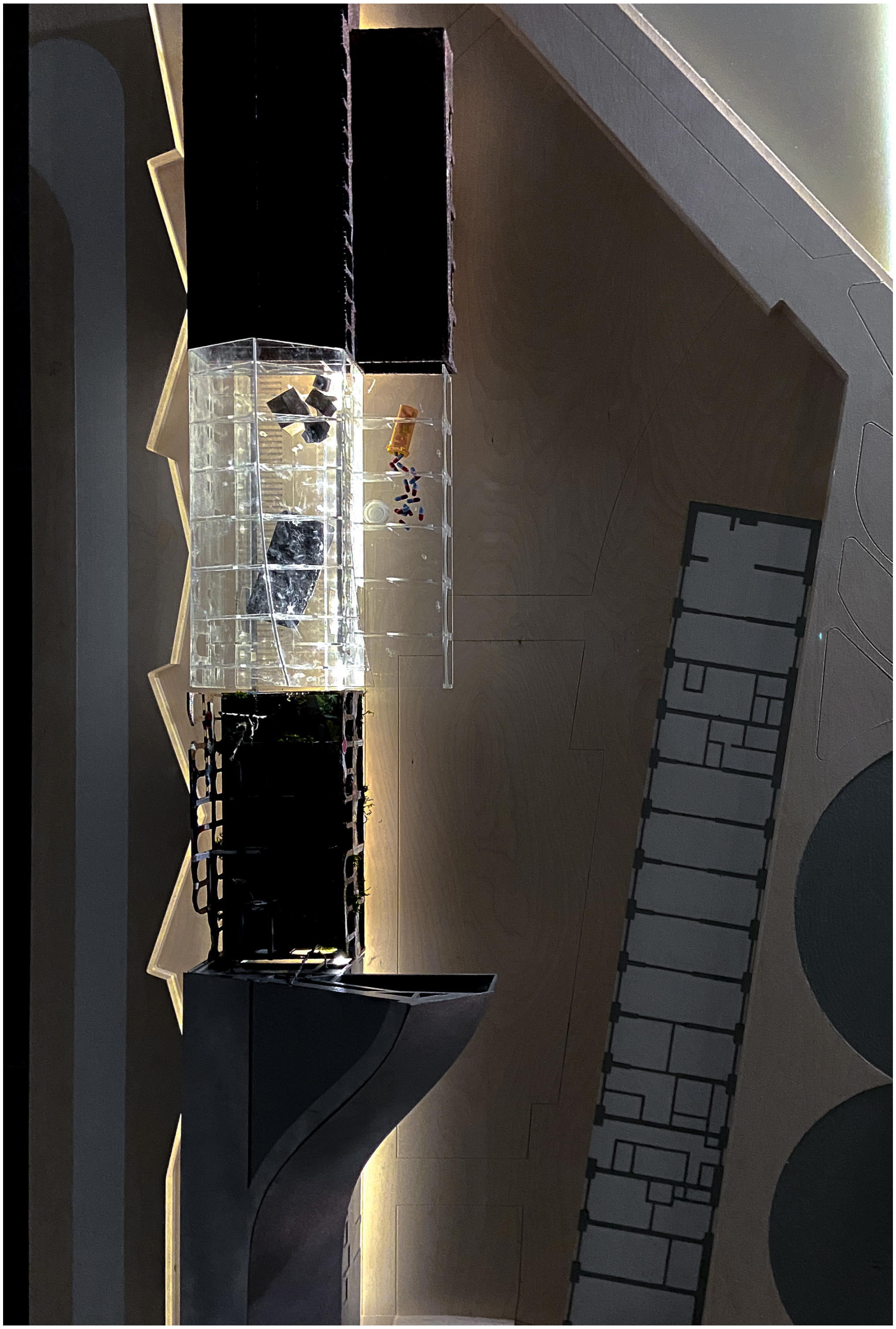
top: step by step guide for creating the twist. this stage of the process was crucial towards developing a grasshopper code that both accurately modeled the structure and where parameterization could be implemented.

left: massing studies for the original twist and the six twist variations generated. parameters are listed alongside to demonstrate which values were modified between variations.

middle: a longitudinal section analysis of the twist, identifying the four means in which the twist is ordered: extensions, diagonals, zones, and bays. from this analysis, the tripartite division of the three zones was measured and implemented into the grasshopper code.

bottom: a sectional representation of the sixth variation programmed with an art exhibition.

grasshopper coding done in collaboration with emily dean and sienna sun *right*: a perspective photo from above of the four models constructed to represent the four different timelines found at coal drops yard.



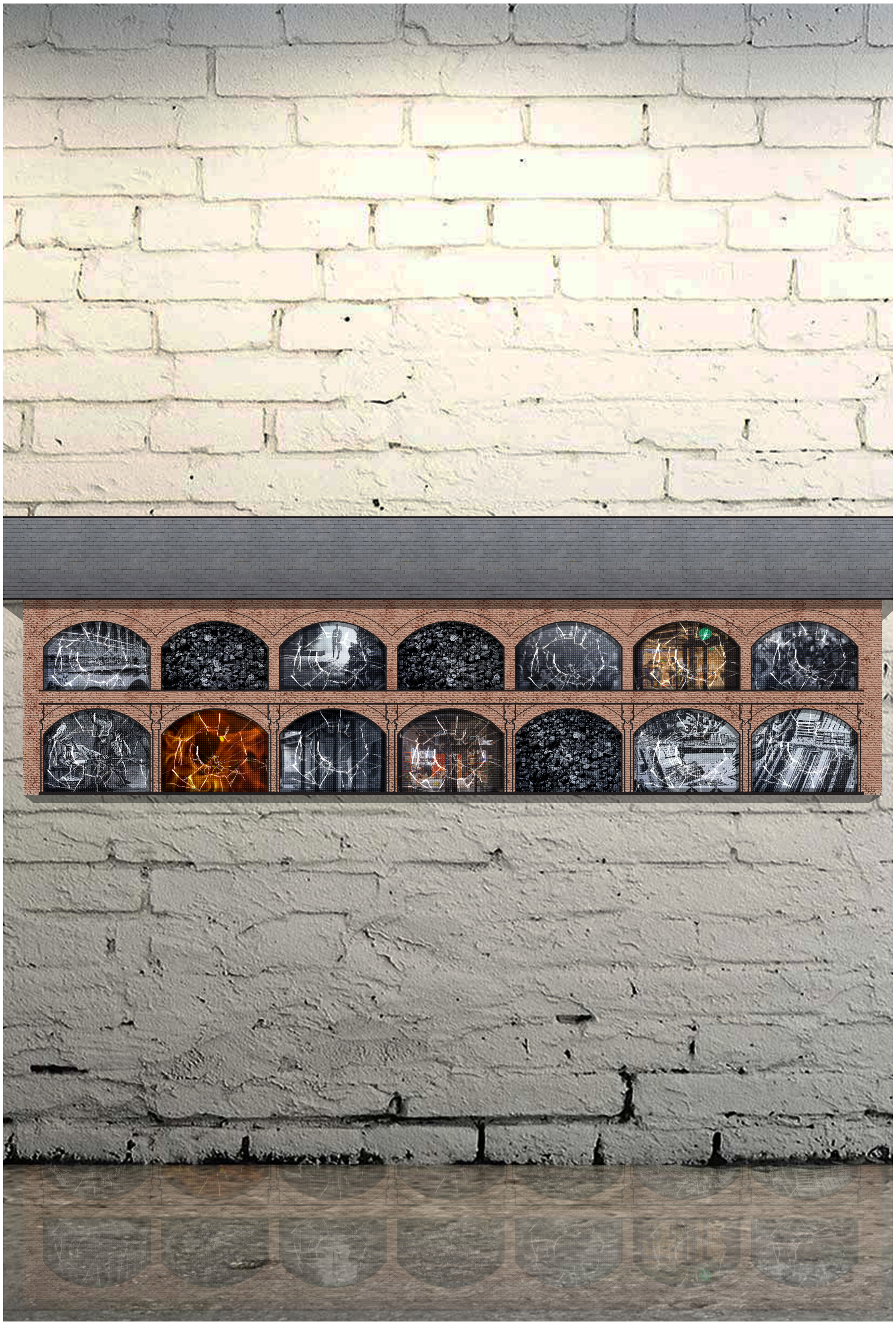
king's cross, london, united kingdom

heatherwick studio's coal drops yard is known for its emblematic kissing roofs, symbolizing the modern reutilization of a nineteenth century coal storage warehouse. besides its railroad roots and flashy new roof, little else is known about the history of these unassuming old warehouses. through a series of social media surveys and deep research, three additional "timelines" were uncovered in parallel with the established "timeline". through physical models and animated digital presentation (utilizing gifs), this project sought to present these four timelines alongside each other to reveal the multiple histories that manifest themselves in the architecture of coal drops yard.

multiple histories

discovering visible and invisible timelines

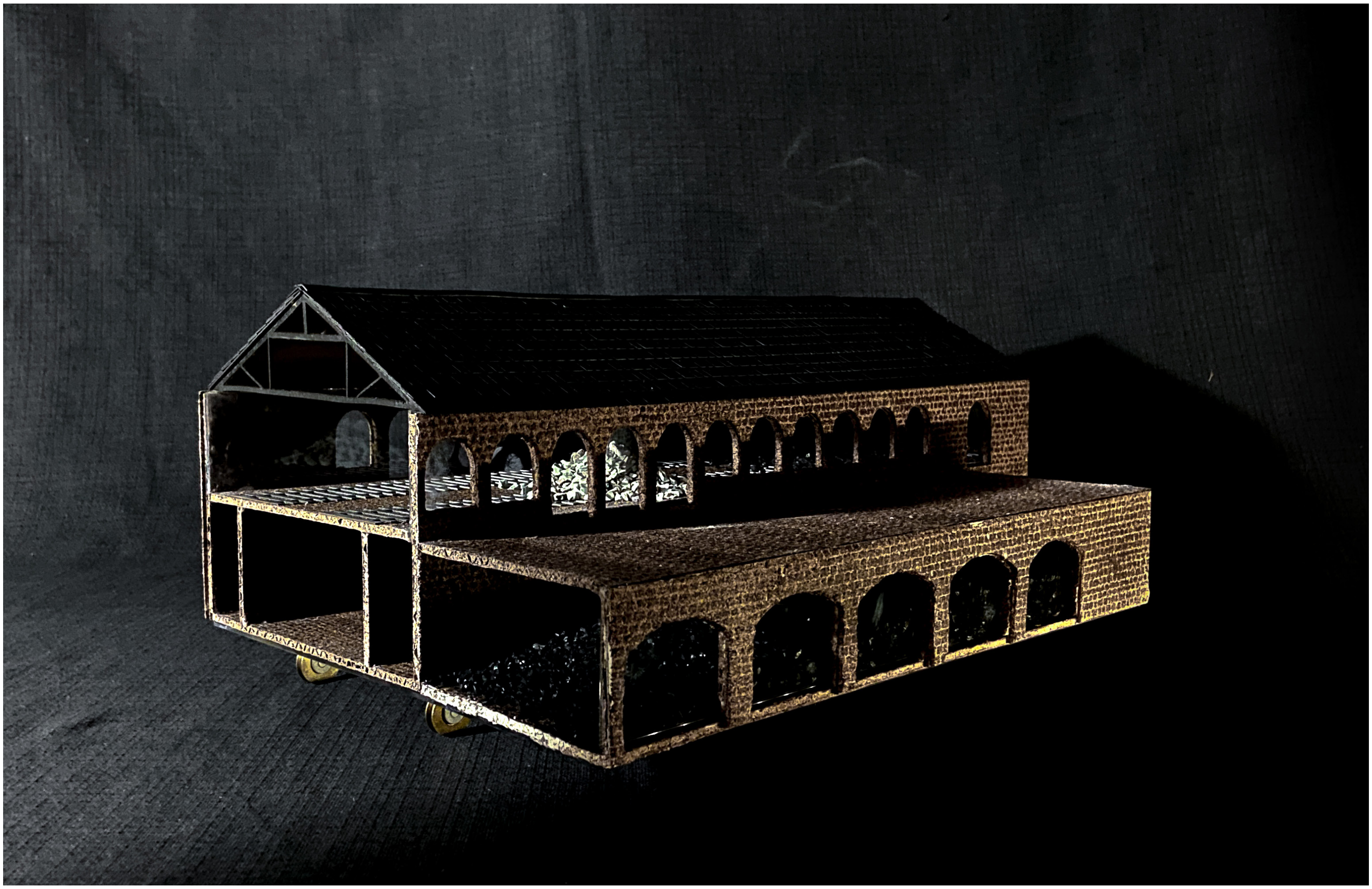
arch8803: representing renovation
professor ryan roark
spring 2021

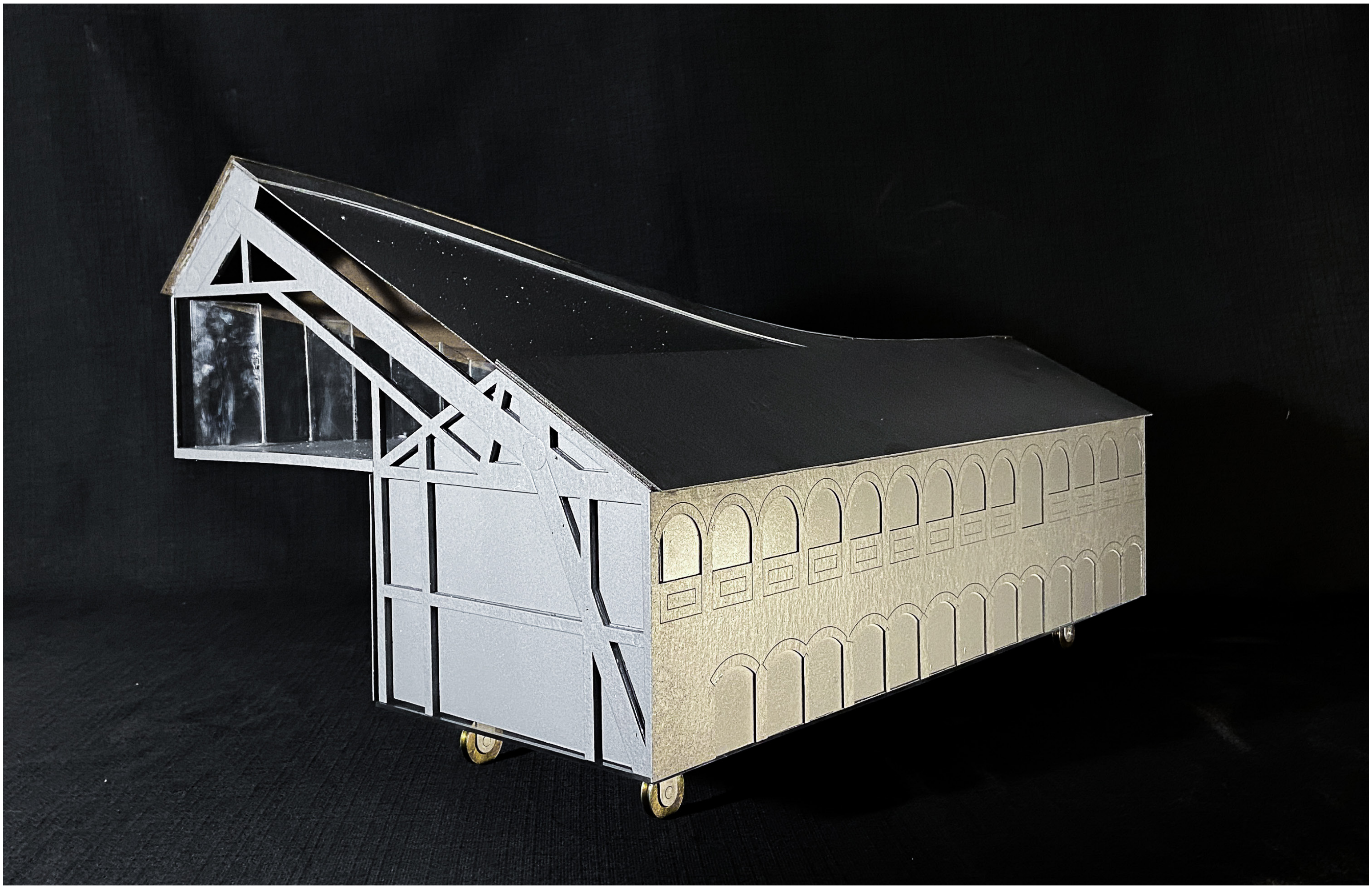


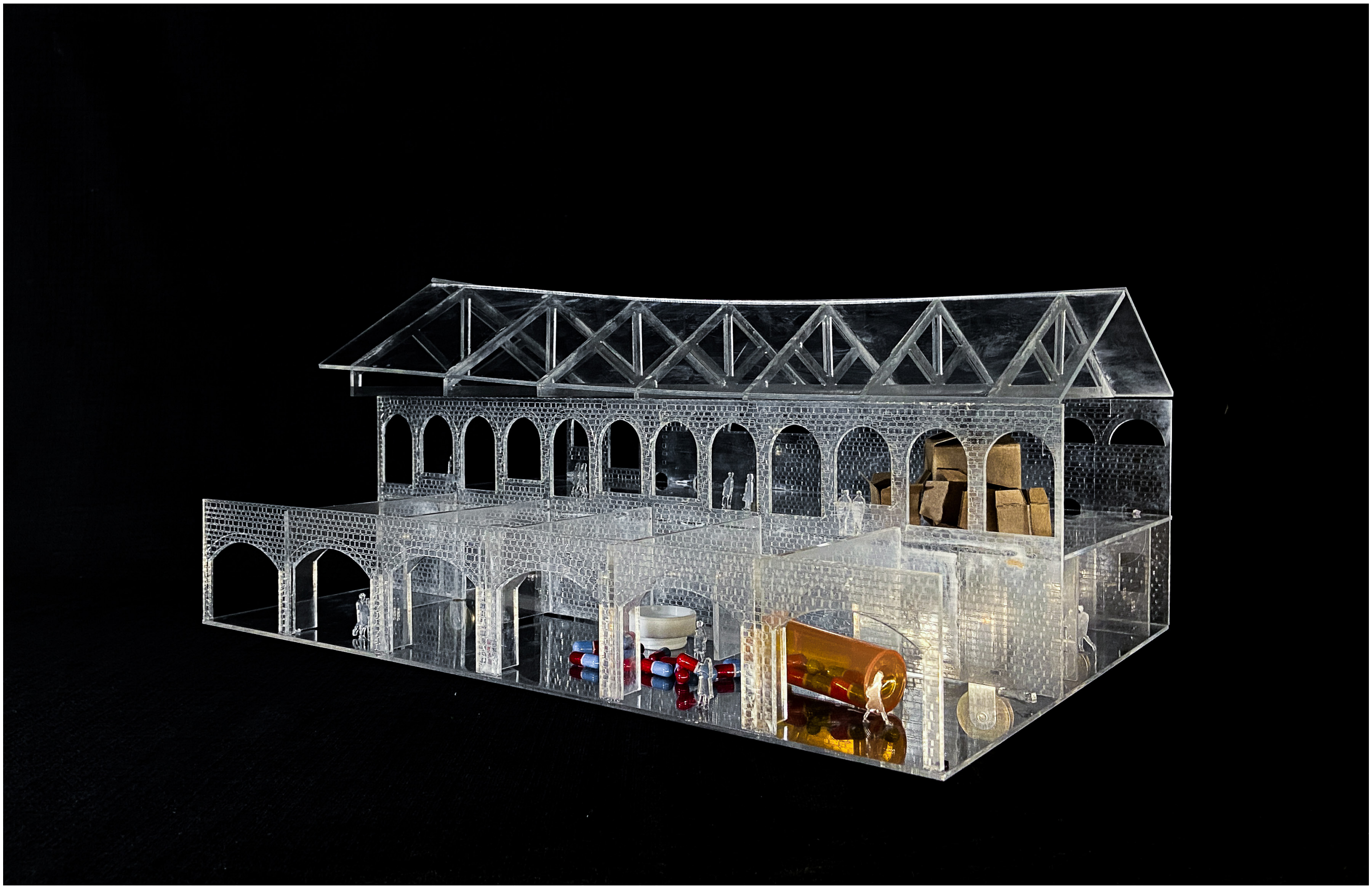
left: an early rendition of an interactive touchscreen display allowing the user to break the glass of storefronts in order to explore the hidden histories behind.

project done in collaboration with rich fridy and ian matthew morey

next spread: final models constructed to portray the four different timelines present at coal drops yard. from top left going clockwise: collected histories (railroad industry and heatherwick intervention) invisible histories (social media data flows and homelessness), organic histories (raves and impromptu fashion shows), and contrived histories (glitzy masterplans and luxury retail). constructed of varying materials including wood, spackle, laser-etched acrylic, and paper-mached chipboard.







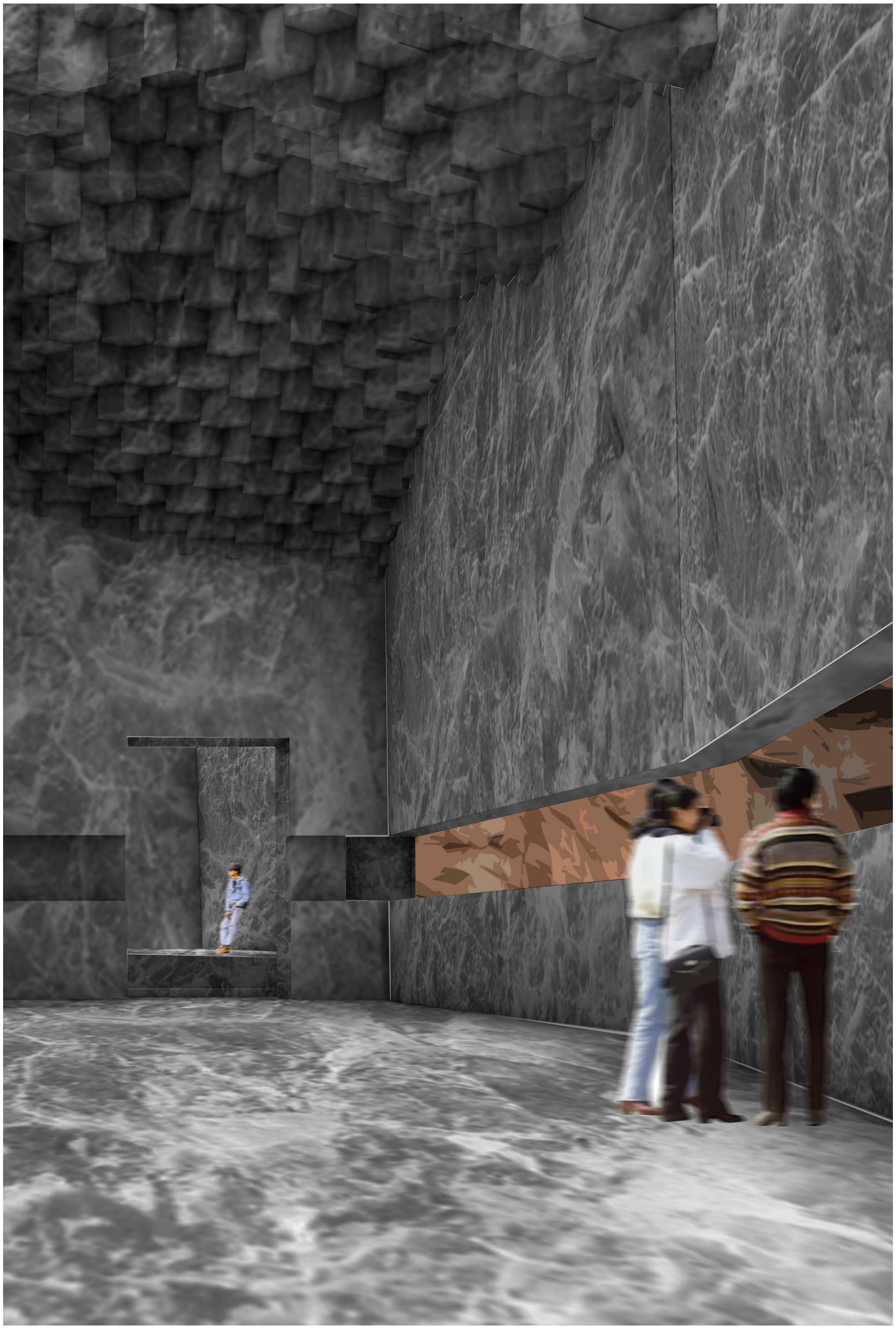
the future
Make coal history
bubblegum pink
old
Google
tton gabardine,

right: an interior perspective of the cave-like atrium, which sought to serve as a meditation space.

opposite page, top left: a materiality study of the stone forms found on-site to be reflected in the exterior materiality of the structure.

opposite page, top right: a section perspective reveals the varying spaces created inside of the structure.

opposite page, bottom: an exploded axonometric drawing with slices at different levels throughout the structure.



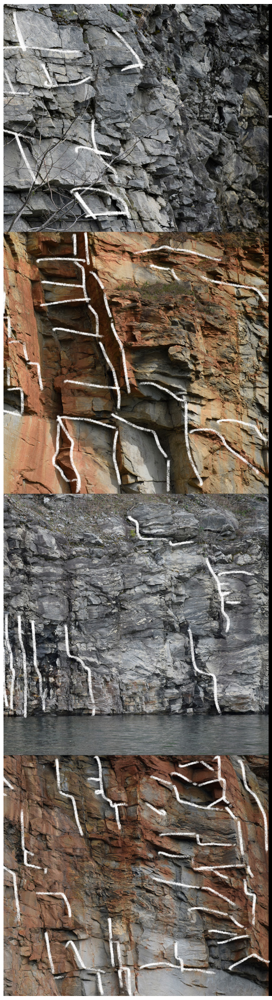
bellwood quarry, atlanta, ga

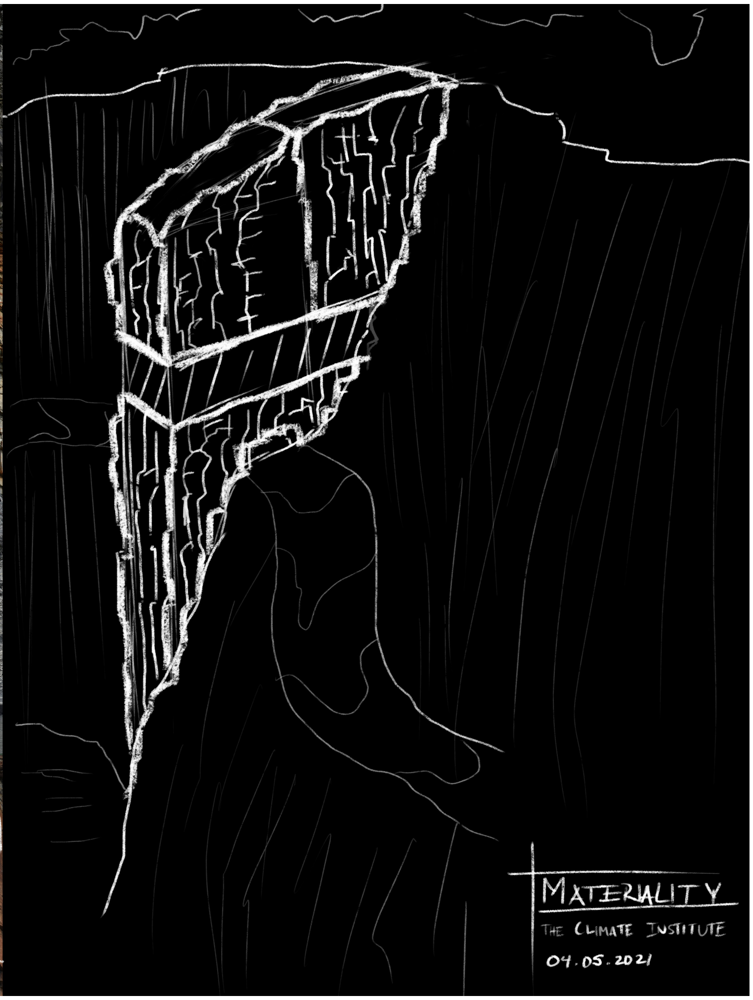
the goal of the climate institute is to provide a place where a multi-faceted approach to combat climate change can be developed. to achieve this goal, the climate institute requires several spaces for advocacy, collaboration, and action. such spaces include a museum and interactive entryway alongside laboratory and research spaces. by embedding itself into the side of a quarry, the climate institute sought to directly address mankind's direct impact on the natural world and confront the realities of human-induced climate change.

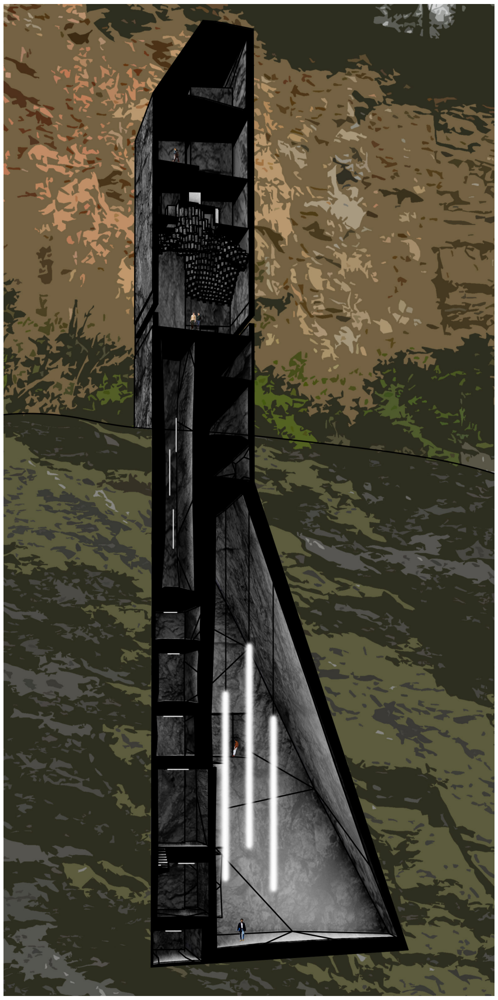
the climate institute

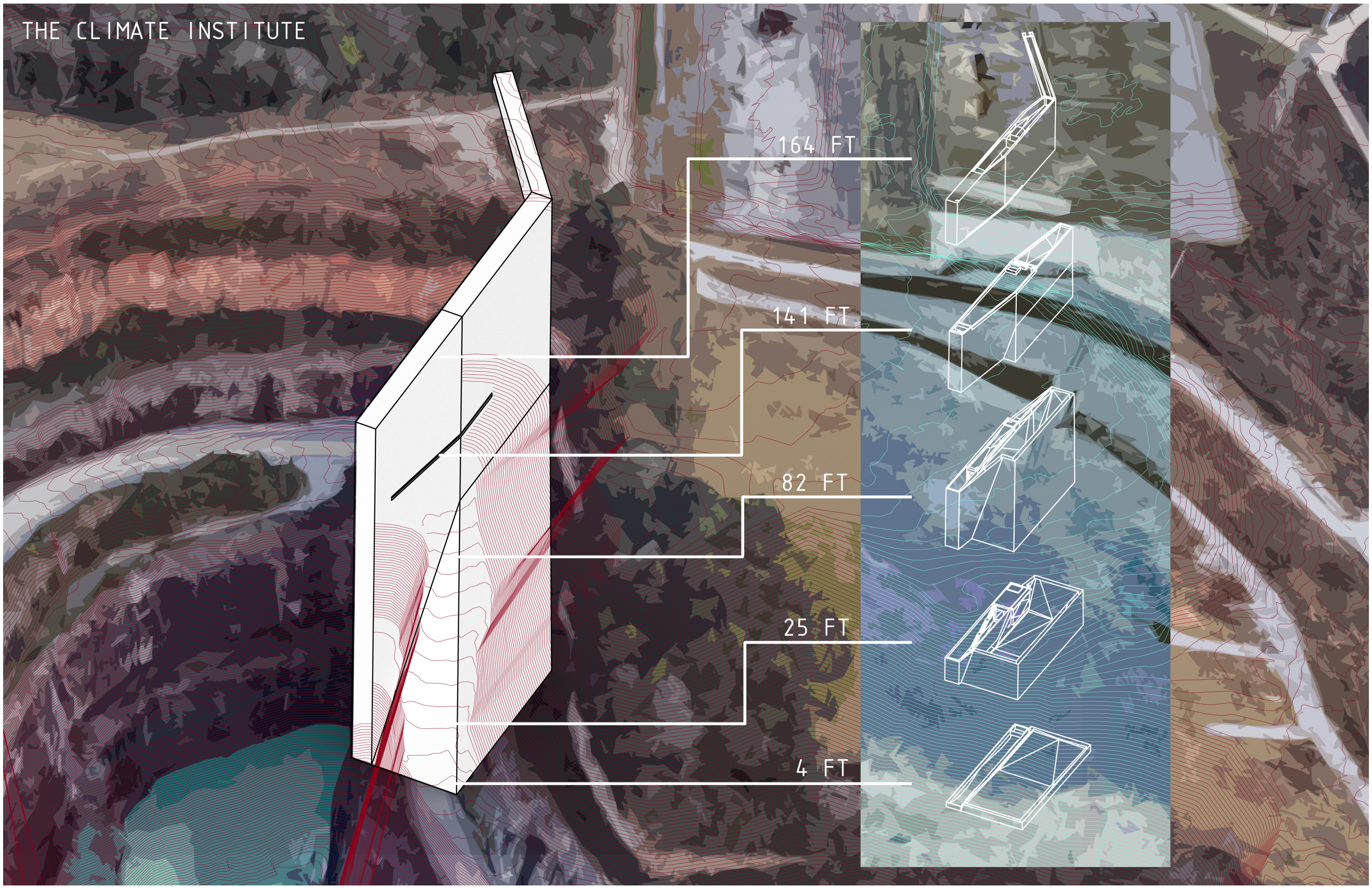
reclaiming the quarry

arch6029: core 2 studio
professor keith kaseman
spring 2021

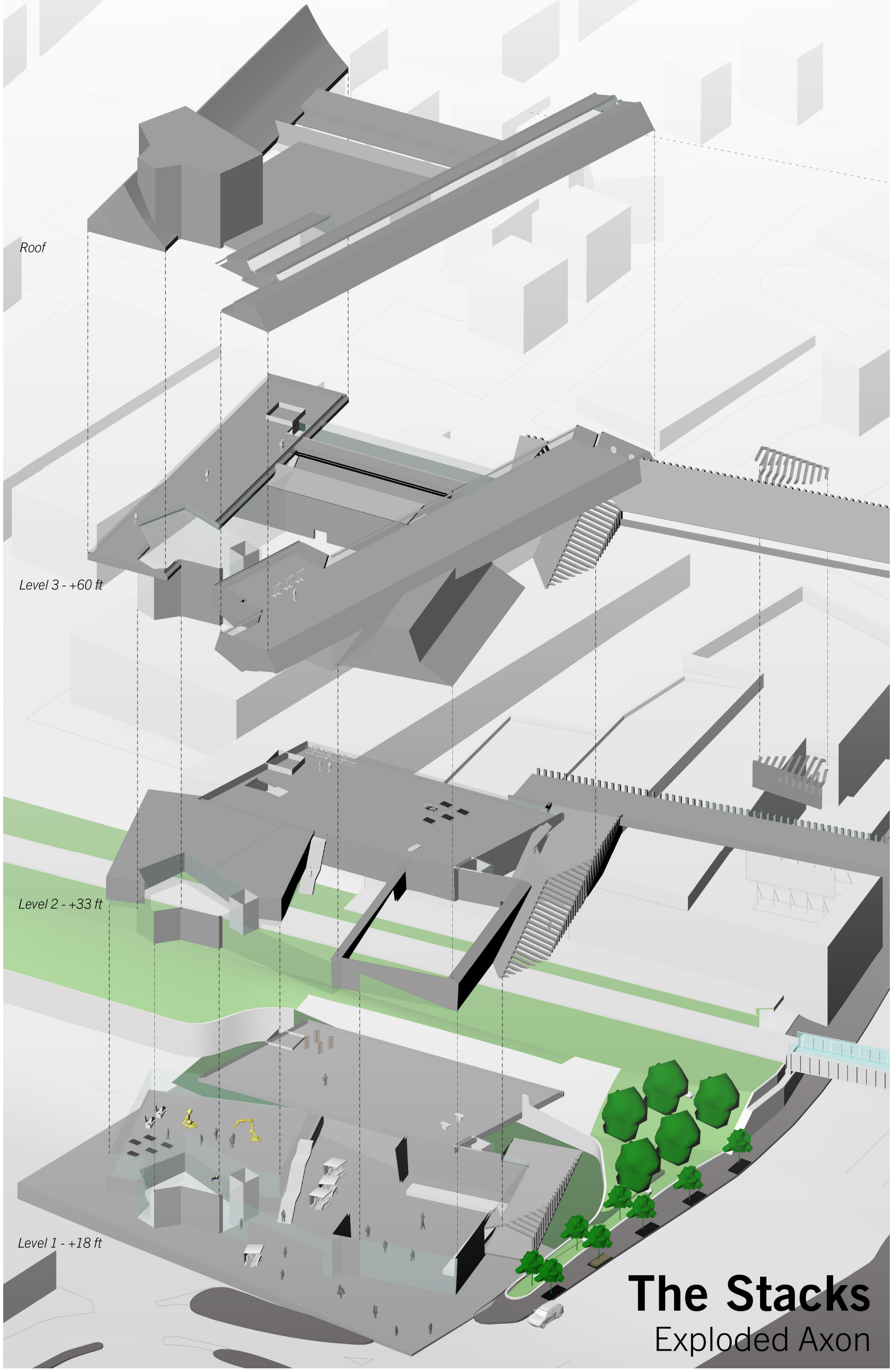



MATERIALITY
THE CLIMATE INSTITUTE
04.05.2021




THE CLIMATE INSTITUTE
164 FT
141 FT
82 FT
25 FT
4 FT

right: an exploded axonometric drawing showing the different levels found in the design.



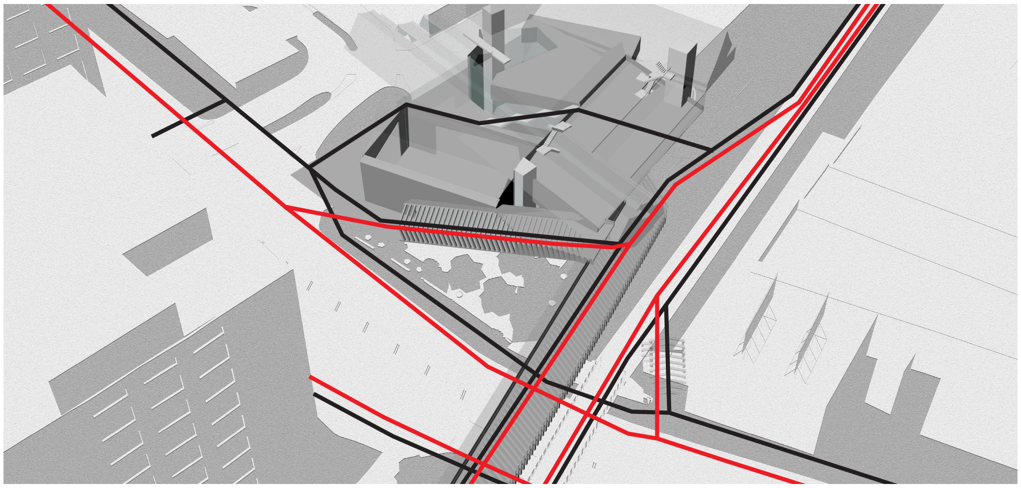
the beltline, atlanta, ga

a series of building profiles were utilized to create unique spaces and connections through the process of extruding forms along existing contextual guidelines. such a form not only provided unique programmatic opportunities, but also allowed a means of establishing the connection between the beltline and ponce de leon avenue. climate analyses were conducted to maximize air circulation through the site while minimizing solar gain.

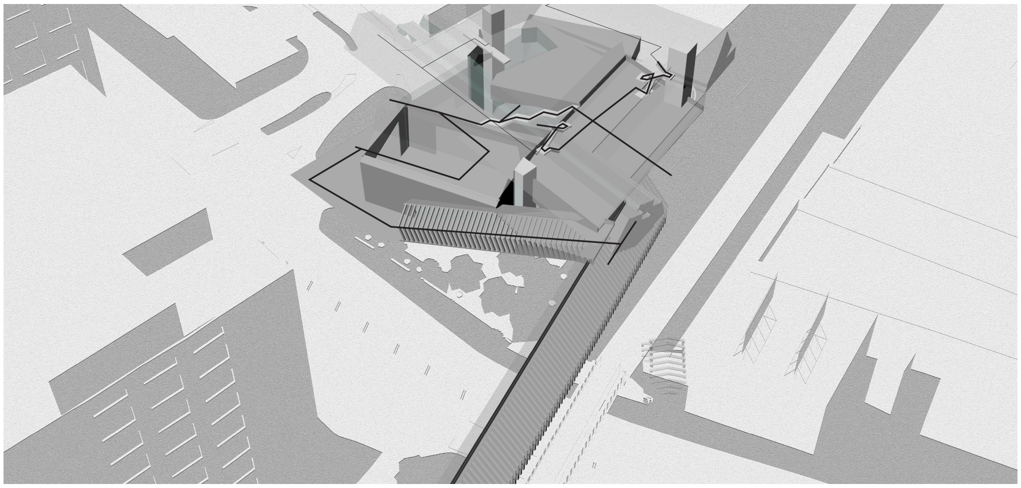
the stacks

reprogramming the beltline

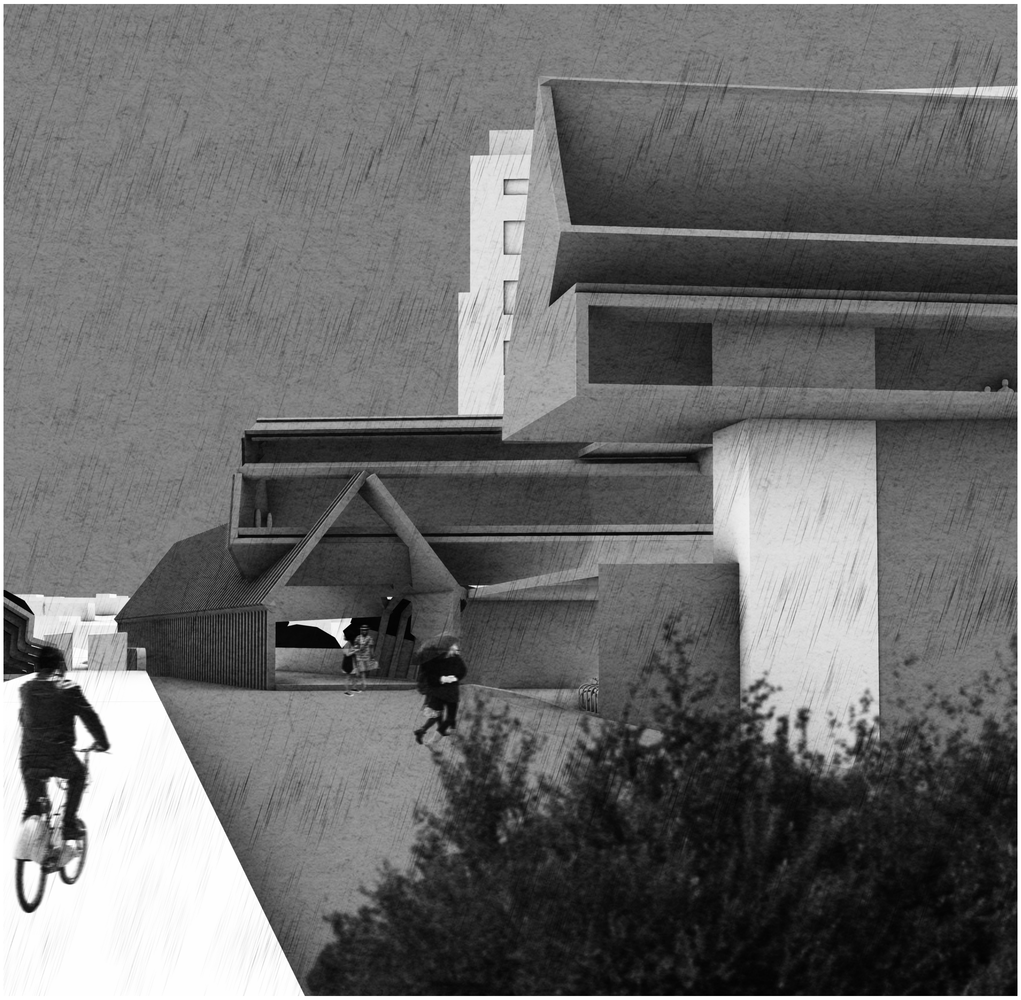
arch6050: core 3 studio
professor daniel baerlecken
summer 2021



left: heavy emphasis was placed on creating a useful and efficient connection between ponce de leon avenue (spanning from top left to bottom right) and the beltline (spanning from top right to bottom middle). red lines indicate exterior bike paths around the structure and through a newly proposed bridge and connection pathways between the street and the trail. black lines indicate how pedestrians can move freely around and through the building through new pathways.

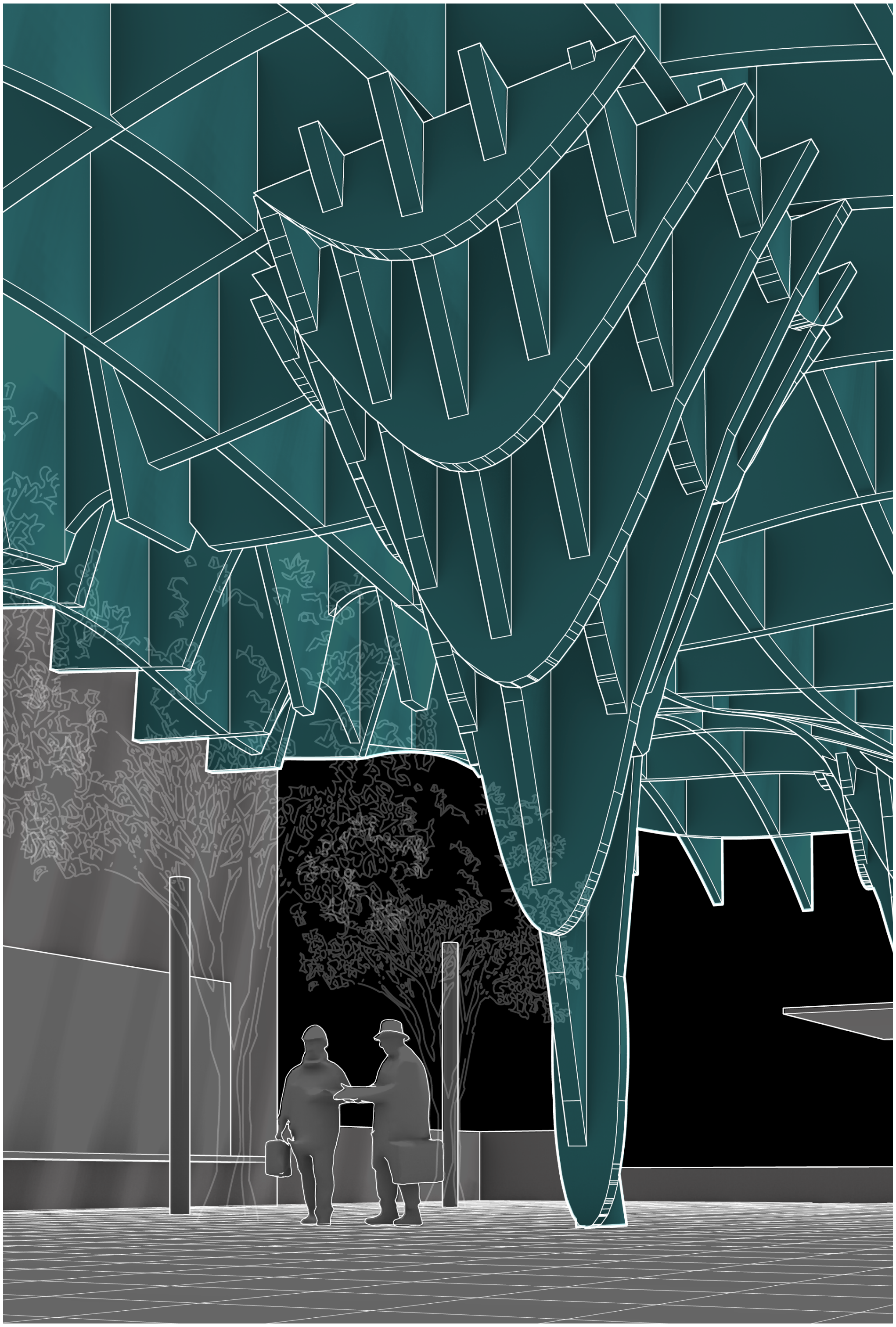


left: interior pathways are shown, with the thicker black lines showing pedestrian movements along the lower floor, while thinner lines depict pedestrian movements through the upper floors.



left: an exterior render looking south from the beltline.

right: a composite render demonstrating the relationship between slotted structural components, humans, and the existing built framework



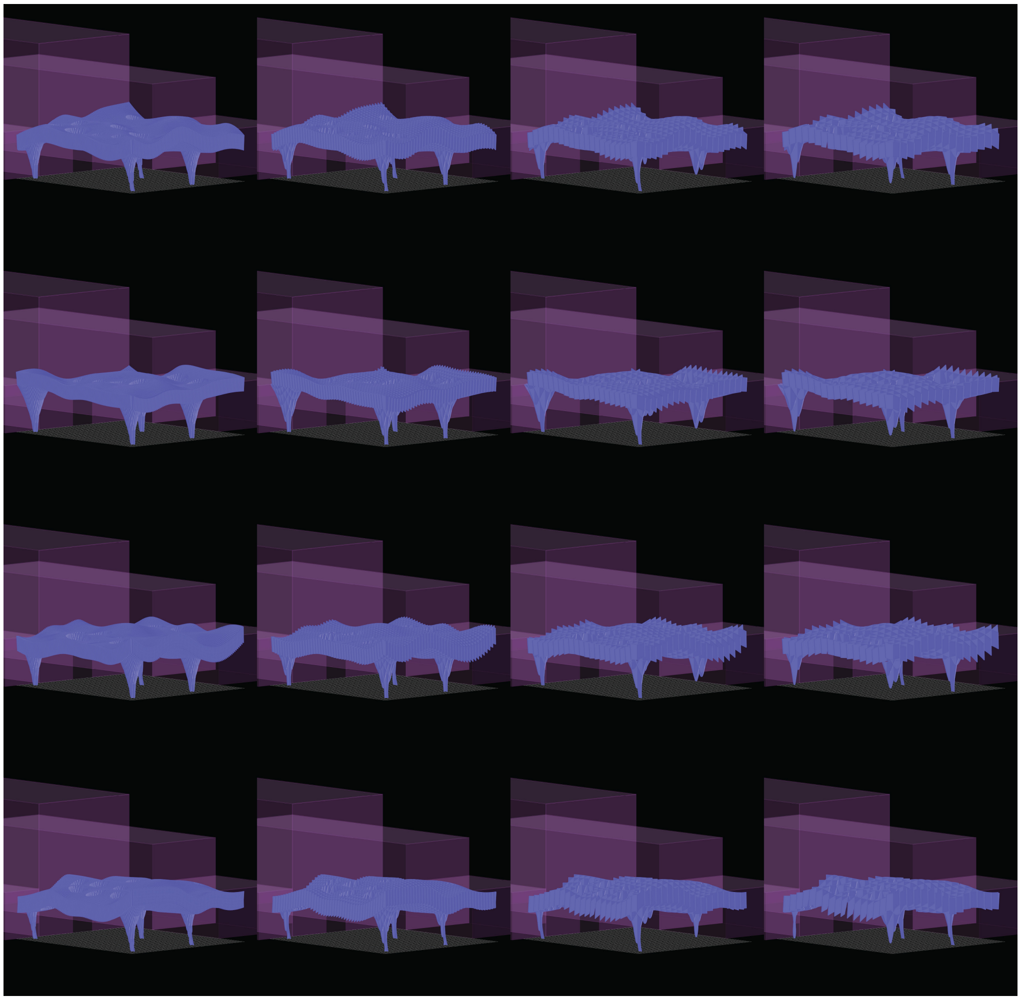
georgia institute of technology, atlanta, ga

inspired by jürgen mayer's metropol parasol, this design for a pavilion sought to reimagine how a lightweight structure can augment an already inhabited space. a system matrix was developed to demonstrate the flexibility of a fully parametric design written in grasshopper. to imagine how the space would be occupied and constructed, a series of filmic sequences were developed within grasshopper to showcase a design scenario.

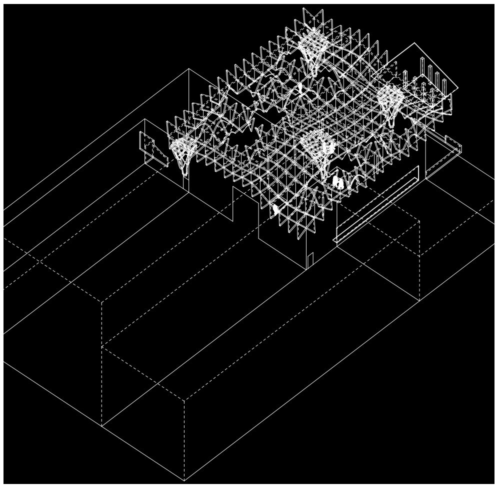
undulations

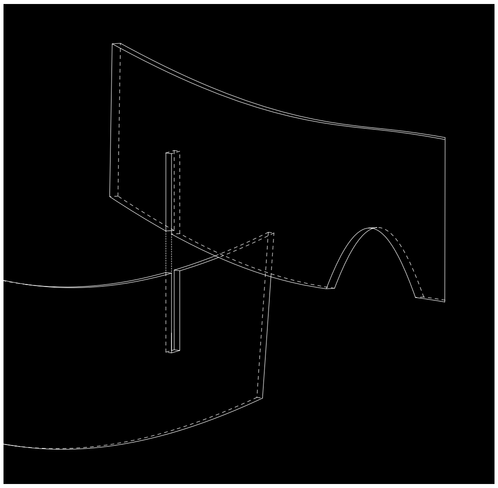
developing a hinman superspace

arch7030: media + modeling 3
professor keith kaseman
fall 2021



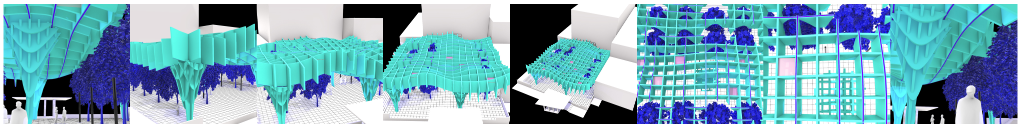
left: variations of the pavilion design, generated using a single parameterized value in grasshopper.





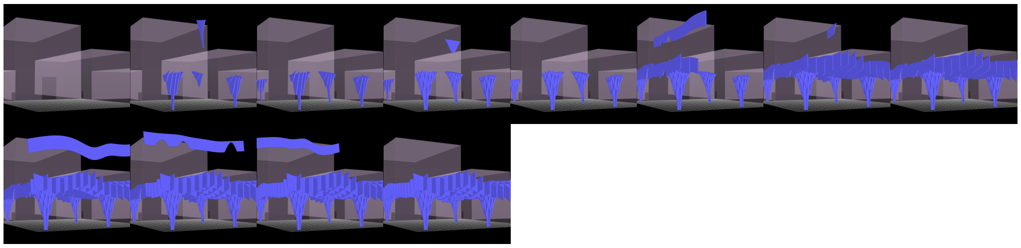
left: a worm's eye view drawing of the chosen pavilion concept

right: a simple illustration depicting the slot-like manner in which pavilion components are assembled

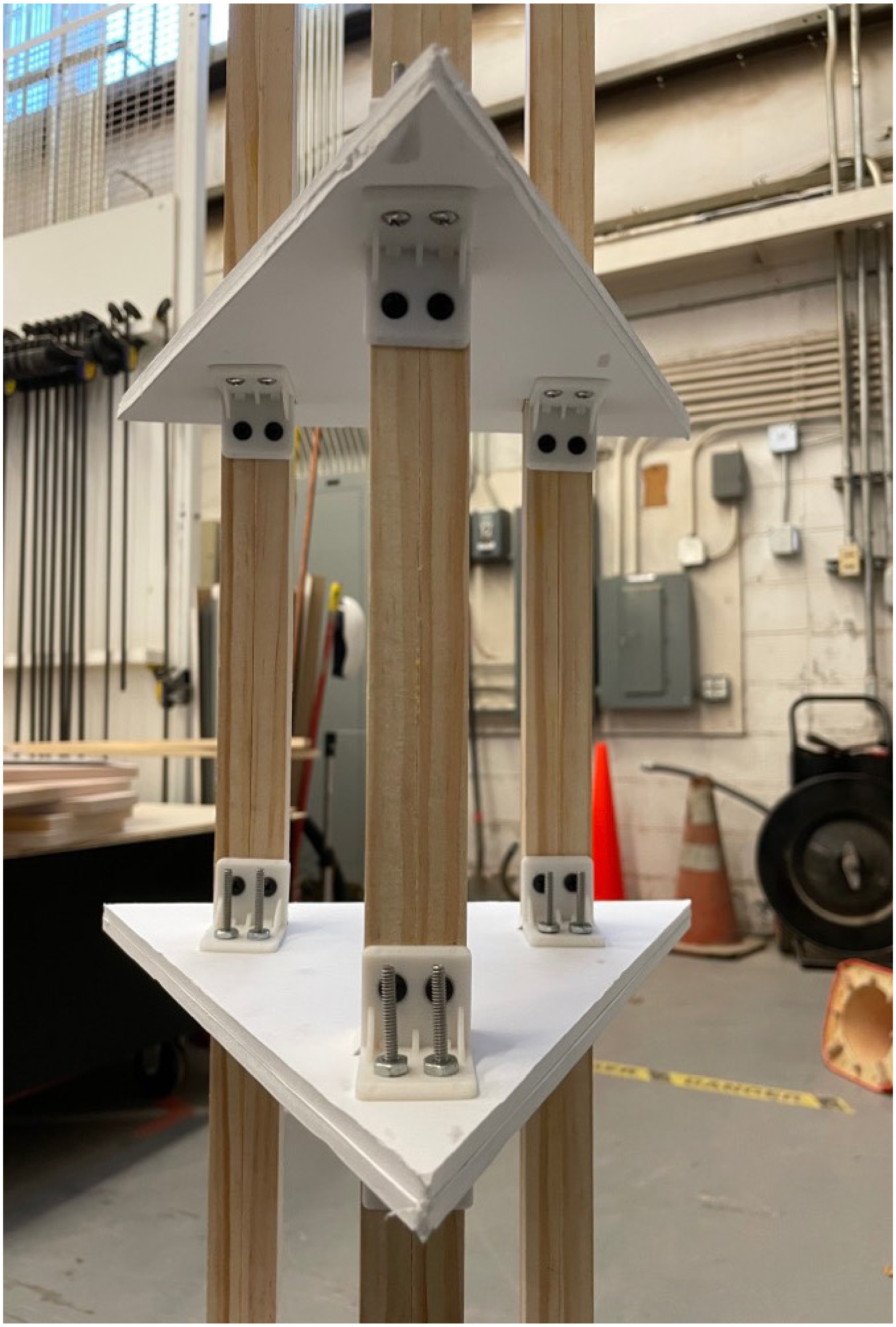


top sequence: a fly-through of the pavilion structure, showing the human perspective and bird's eye perspective

bottom sequence: pieces of the pavilion are assembled in a bottom-up manner, slotting pieces in place. first, the columns are assembled before the canopy is slotted in place



project done in collaboration with emily dean and colin finnigan *right*: a detail image of the final built tower, illustrating the foamcore floor plates, wooden dowel columns, and plastic fasteners with screws.

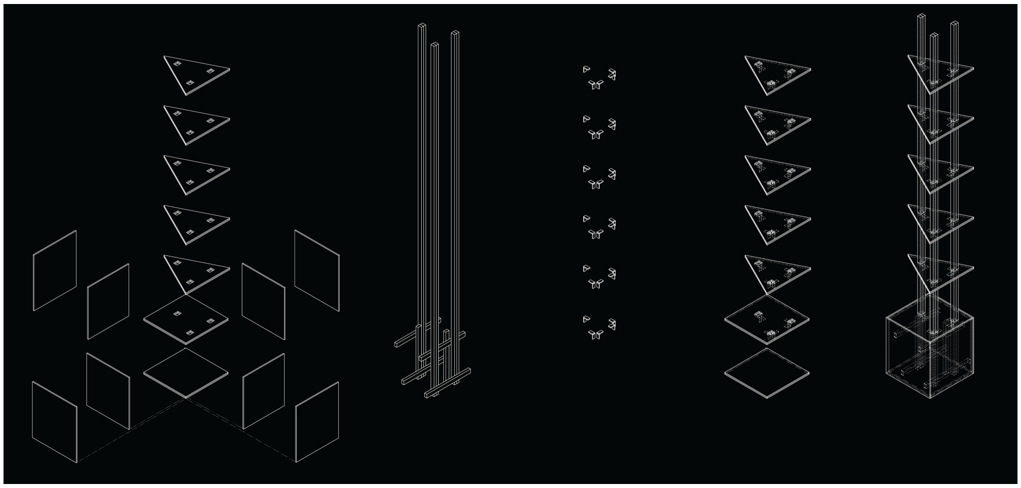


this competition tasked each group with developing, constructing, and analyzing a tower concept design. using a moment-frame structure, the design leveraged foamcore, sika postfix, wooden dowels, and plastic braces while keeping the structure under a limit of seven pounds. the structure outperformed expectations, supporting a total weight of 149 pounds, highest in the competition.

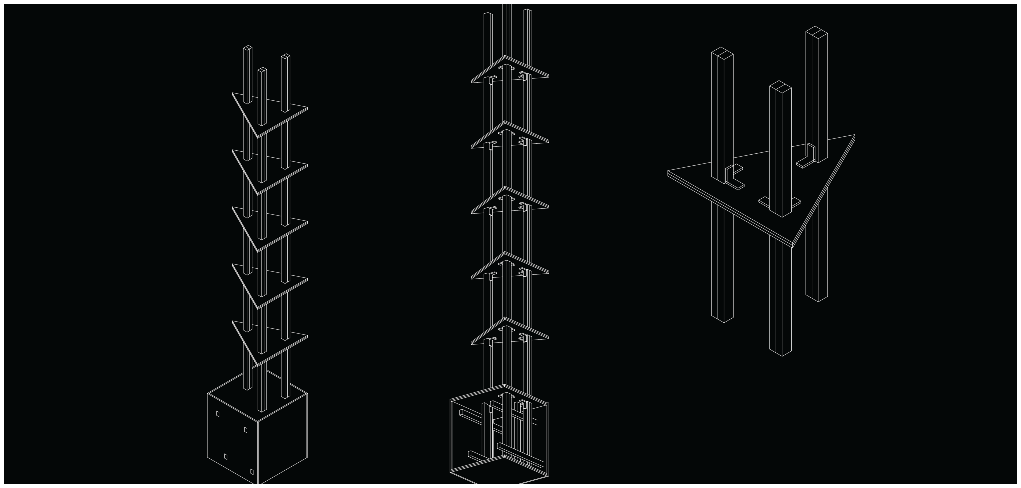
design-build-test

developing a moment-frame tower

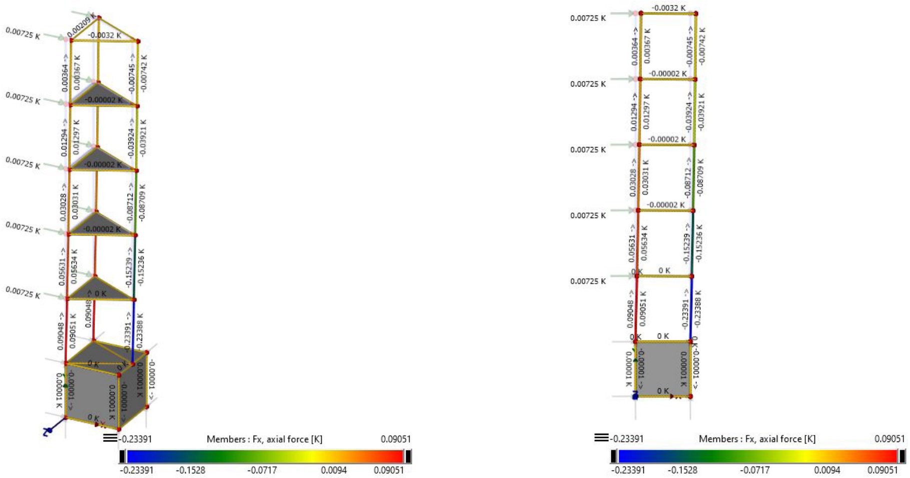
arch8833: integrated building systems 1
professors yasser el masri and noel flores
fall 2021



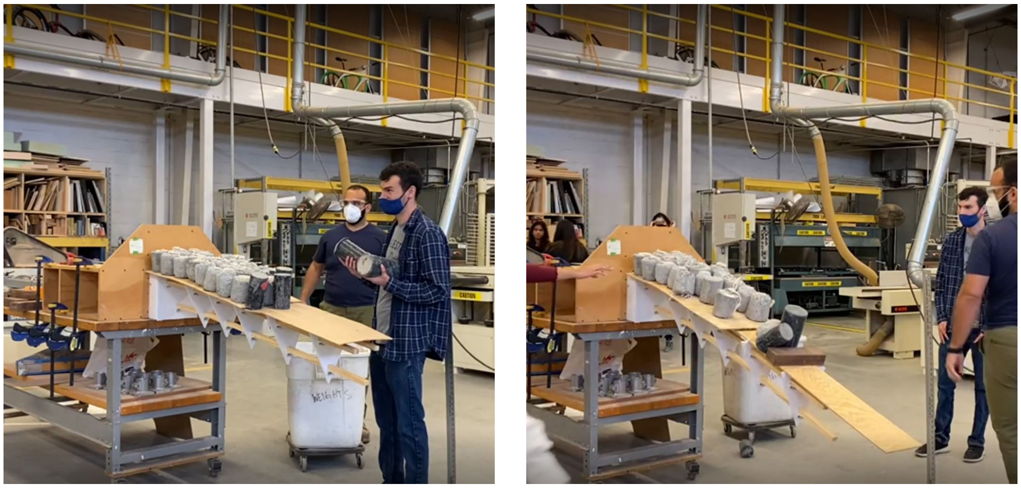
left: an exploded axon of the tower concept, along with the systems embedded within the design. a series of interlocking wooden dowels, plastic braces, and foamcore braces and foam plates create a simple yet effective design.



left: drawings of the final design depicting the interior system of the base and a detail view of the connection at each floor plate.


0.00725 K
-0.0032 K
-0.00002 K
0 K
Members : Fx, axial force [K]
-0.23391
-0.1528
-0.0717
0.0094
0.09051

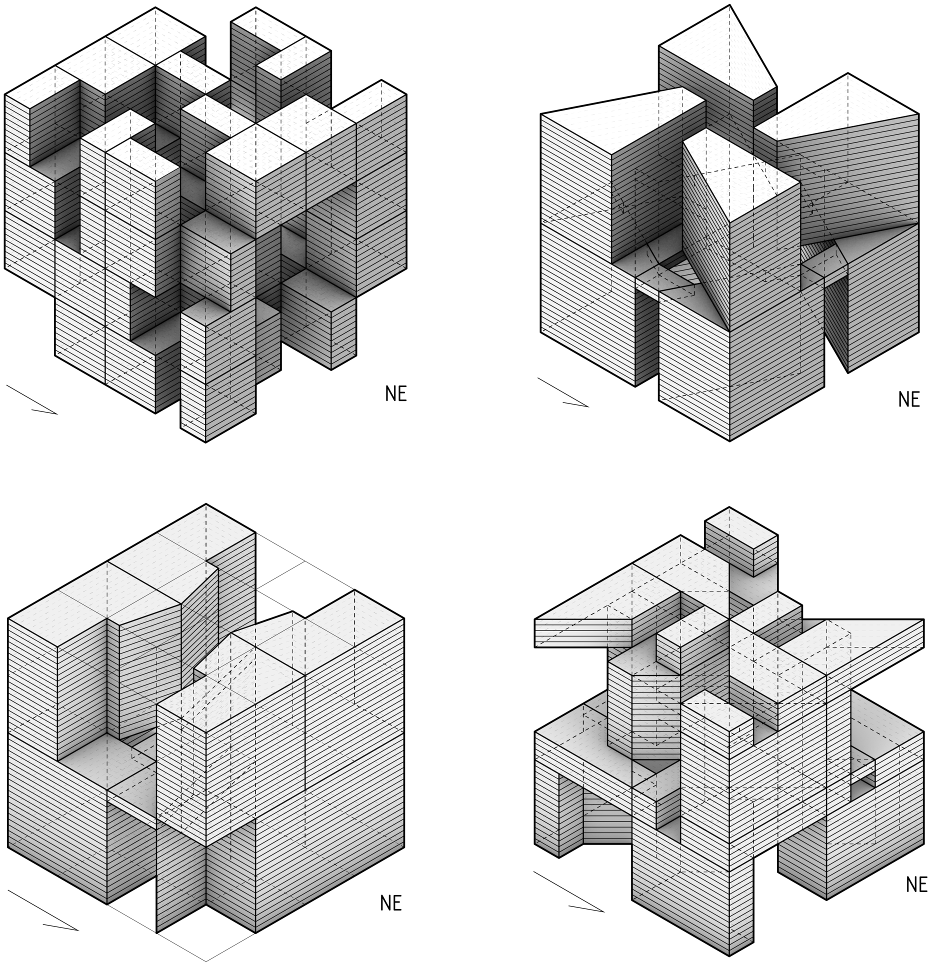
left: the resulting loads and deflections using visual analysis.



left: testing the tower in georgia tech's digital fabrication laboratory. the structure was able to support a weight of 149 pounds under a maximum deflection of 18.5 inches, with a strength to weight ratio of about 21.6.

project done in collaboration with rich fridy, heidi davari, hasrat kaushal, mackenzie shinnick, and harshika seth *opposite page*: daylighting analysis of each iteration, with each column representing a different time of the day. the left column is morning daylight taken at 0800, the middle column is peak daylight taken at 1300, and the right column is evening daylight taken at 1700.

below: axonometric drawings of each cube iteration (with iteration 1 at the top left, iteration 2 at the top right, iteration 3 at the bottom left, and iteration 4 at the bottom right).

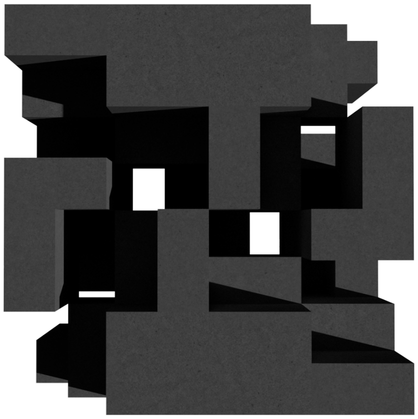
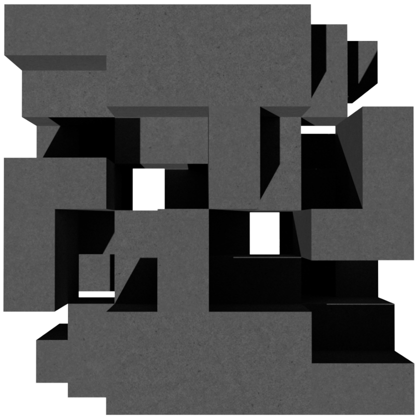
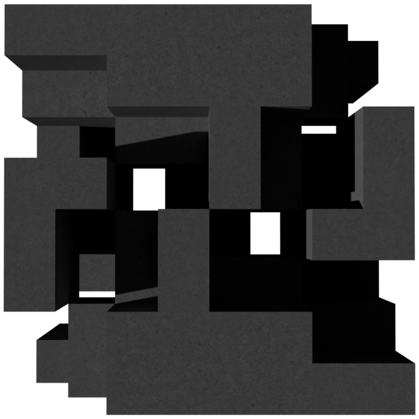
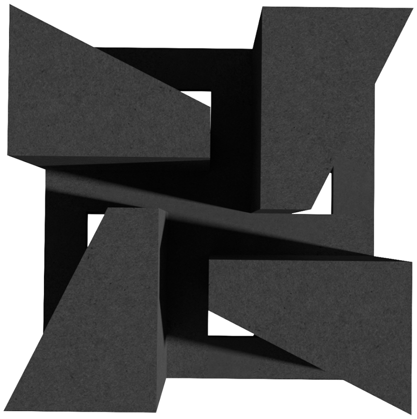
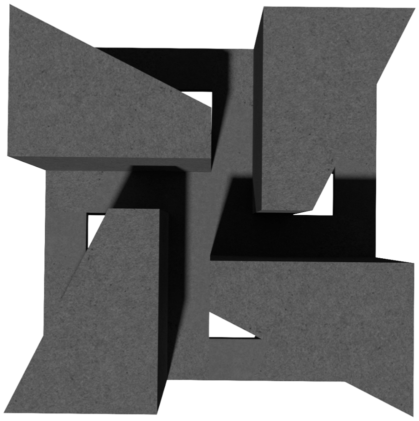
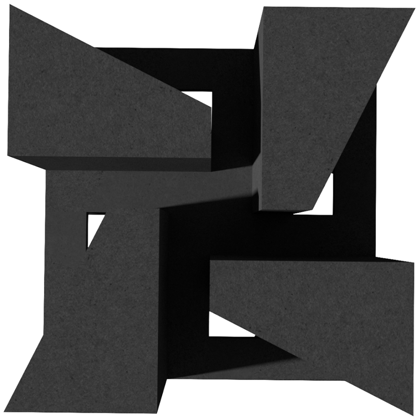
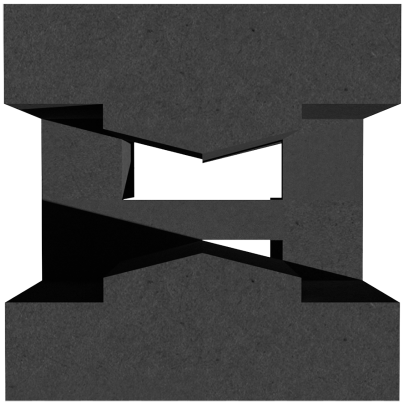
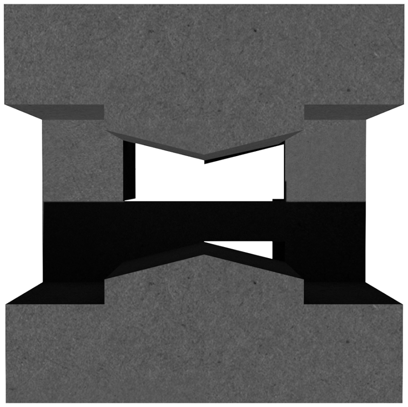
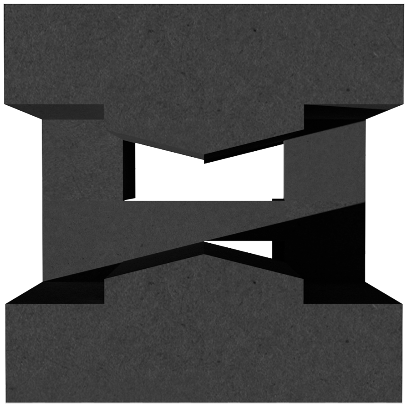
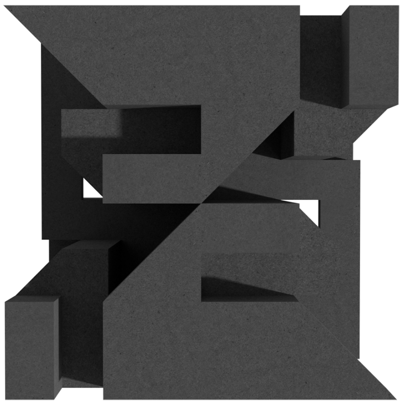
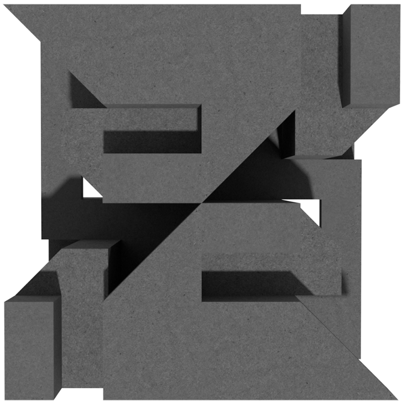
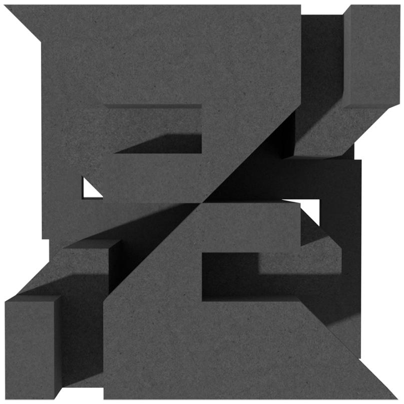


each iteration began with a proposition and division of a 40’ cubes into 8 smaller 20’ subcubes, which were in turn broken down further into a 10’x10’x10’ matrix of microcubes. the initial subcube was rotated across its respective level, with an offset to produce variability on the layer above. each proposition either explored extensive properties, intensive properties, or a combination of the two. utilizing each of these propositions, a hypothesis was developed, tested, and employed in the development of the subsequent iteration. the final iteration employed a system of diagonal cuts to play with experiences of light and shadow in order to develop opportunities for refraction and softer penumbral shadows.

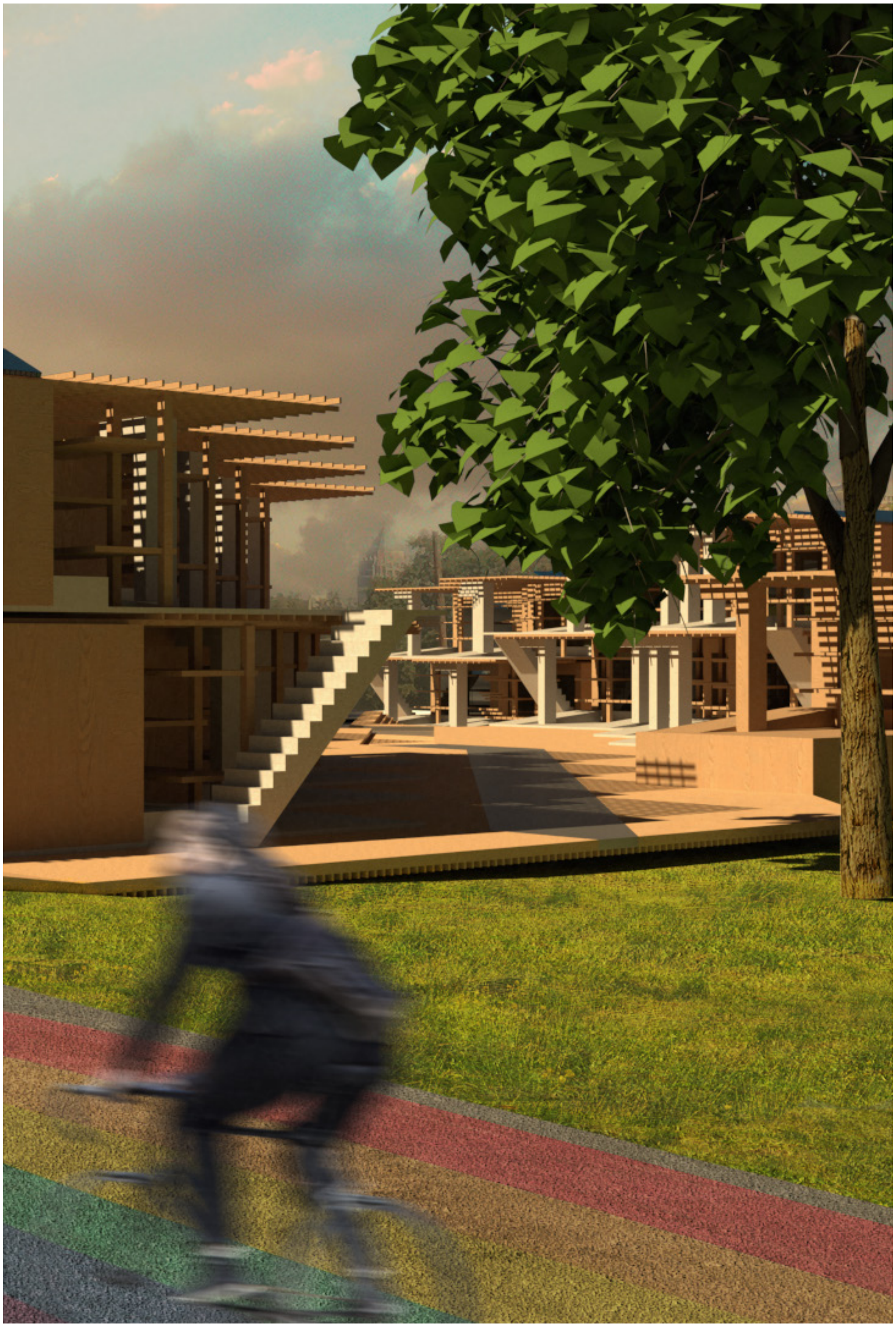
rotations

light-space-matter modulator

arch6039: advanced studio 1
professor frederick m pearsall
fall 2021

right: a canopy level view of the project, highlighting the importance of the grid.



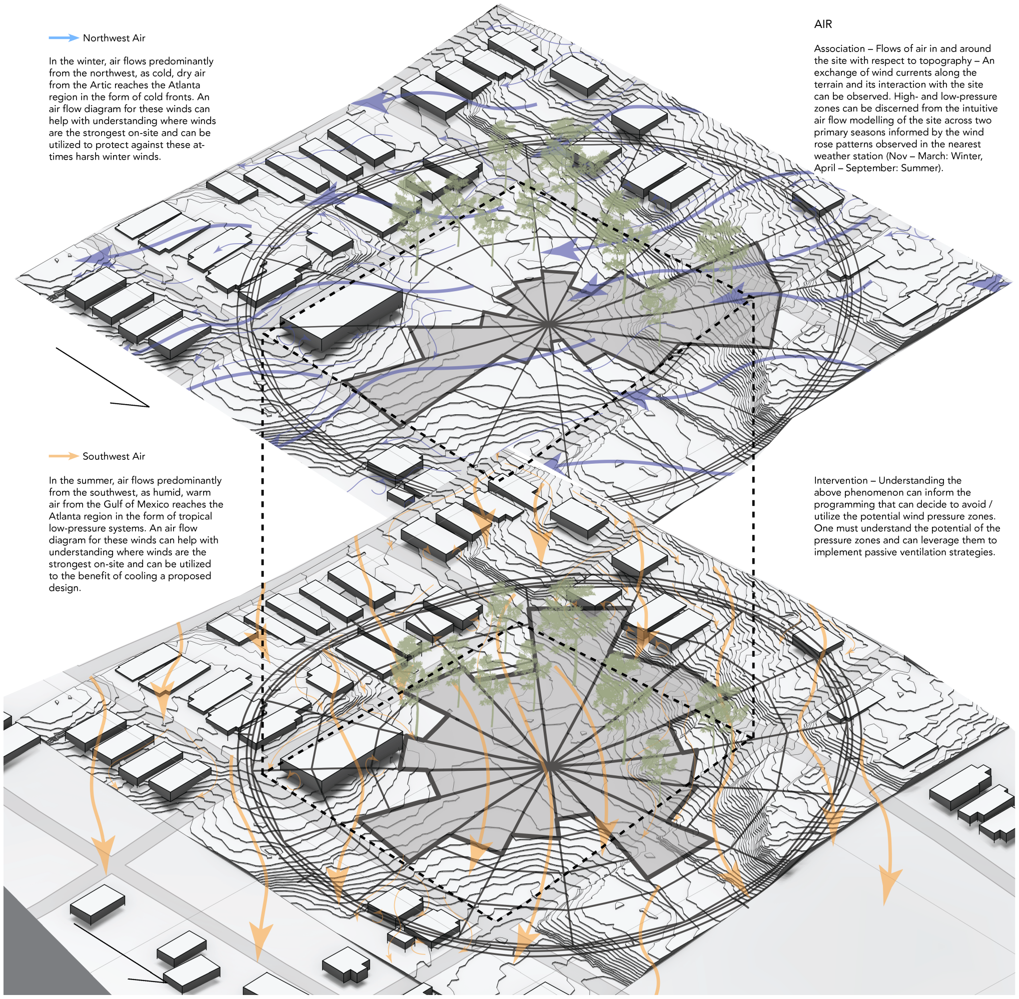
vine city, atlanta, ga

this project began with analyzing the impact in which the four elements – air, water, fire, and earth – had on the site. these observations led to the development of six strategic moves, each targeting a pre-existing natural or social phenomenon. these moves not only seek to address these conditions, but also act to amplify and build upon these eccentricities. by drawing from both social and ecological elements, this project allows for the free movement of both people and nature across time and space, allowing such processes to continue unhindered while cultivating a reemerging community.

reconnecting the elements

the vital social-ecological system of community

arch6039: advanced studio 1
professor frederick m pearsall
fall 2021



Northwest Air

In the winter, air flows predominantly from the northwest, as cold, dry air from the Artic reaches the Atlanta region in the form of cold fronts. An air flow diagram for these winds can help with understanding where winds are the strongest on-site and can be utilized to protect against these at-times harsh winter winds.

AIR

Association – Flows of air in and around the site with respect to topography – An exchange of wind currents along the terrain and its interaction with the site can be observed. High- and low-pressure zones can be discerned from the intuitive air flow modelling of the site across two primary seasons informed by the wind rose patterns observed in the nearest weather station (Nov – March: Winter, April – September: Summer).

Southwest Air

In the summer, air flows predominantly from the southwest, as humid, warm air from the Gulf of Mexico reaches the Atlanta region in the form of tropical low-pressure systems. An air flow diagram for these winds can help with understanding where winds are the strongest on-site and can be utilized to the benefit of cooling a proposed design.

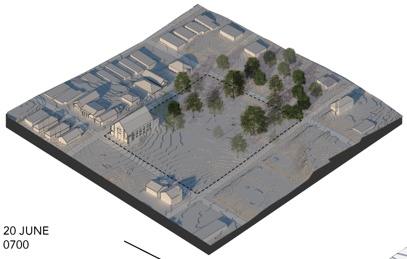
Intervention – Understanding the above phenomenon can inform the programming that can decide to avoid / utilize the potential wind pressure zones. One must understand the potential of the pressure zones and can leverage them to implement passive ventilation strategies.

top: a mapping analysis of the element air, showing air flows through the site overlaid with a wind rose during high intensity rainfall events. the two mappings demonstrate a clear change in prevailing wind flow patterns between the cold, dry northwest winds during the winter and warm, humid southwest winds during the summer.

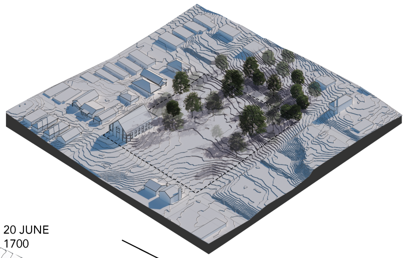
HEAT

Association – Daylight from the sun casts varying shadows onto the site in tandem with its undulating landscape. Light and shadow zones can be configured from the simulation of the site at different times during the day tested on the summer solstice, the day in which the site experiences maximum solar exposure. The model also attempts to recreate the shadows of the past that were experienced on-site as a result of the foliage. Reflective arrows intuitively indicate the heat emittance and reflectance expected from the surrounding buildings onto the site.

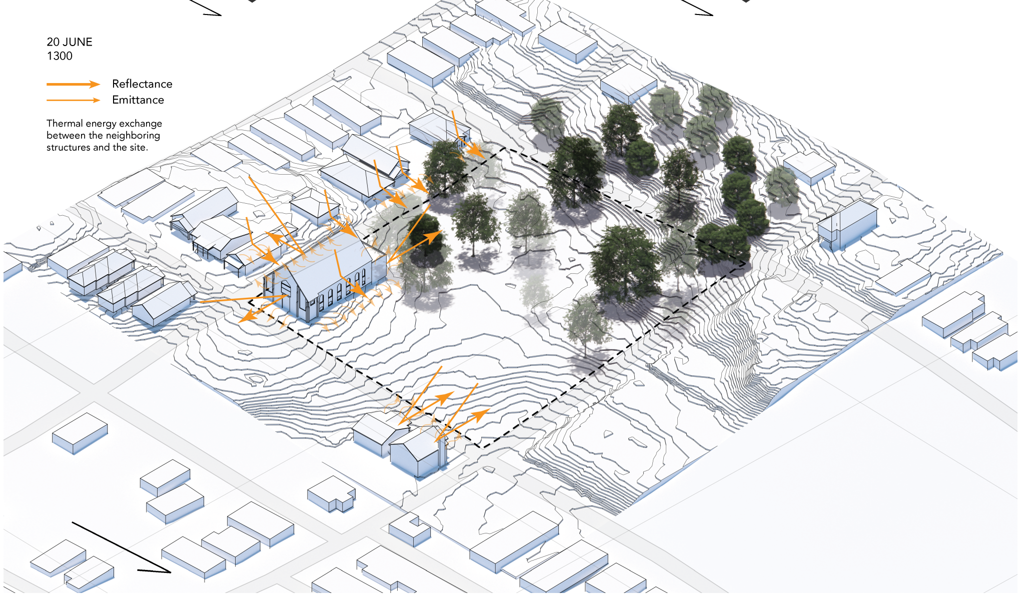
Intervention – Understanding the shading pattern can enable one to understand the potential zones that receive maximum daylighting. This knowledge could be used to inform one's zoning on-site as per lighting requirements. The recreated past through shadows opens possibilities to reintroduce the foliage as prevalent as before to improve the experience of the site.



20 JUNE
0700



20 JUNE
1700



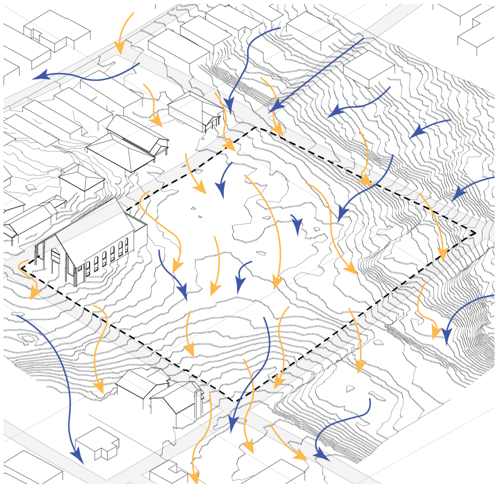
20 JUNE
1300

Reflectance
Emittance

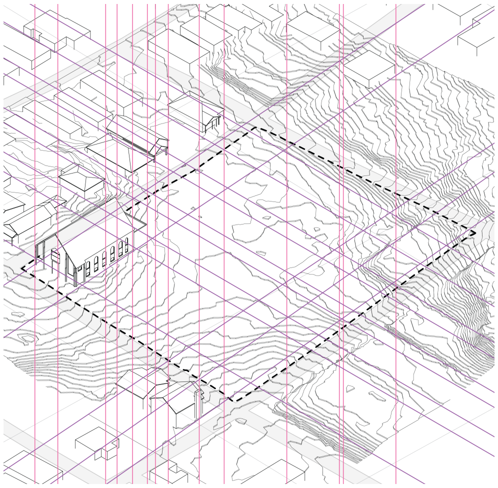
Thermal energy exchange between the neighboring structures and the site.

bottom: a mapping analysis of the element fire, which was interpreted as light and heat. the three different mappings show variable shading conditions at 0700, 1300, and 1700 during the height of the summer. past and present tree canopies are shown in conjunction with reflectance and emittance rays to demonstrate the relationship between context and site.

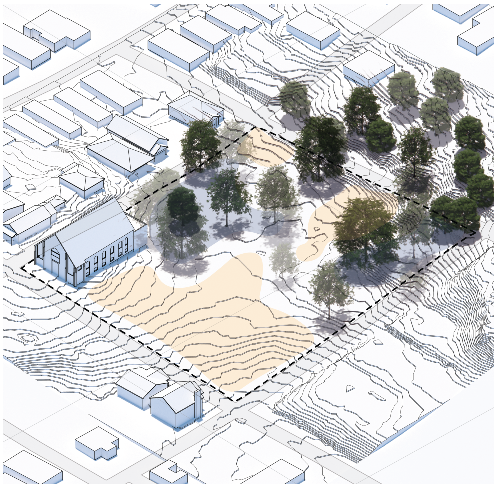
mappings and programming matrix done in collaboration with riya shah *strategic move 1 - framing elemental flows and processes*: elemental flows, such as water and wind, should be allowed to freely translate across the site. pathways should function as arteries for both the elements and for humans. these can also be visualized as areas of low pressure and areas of high pressure, attracting and repelling the elements, respectively.

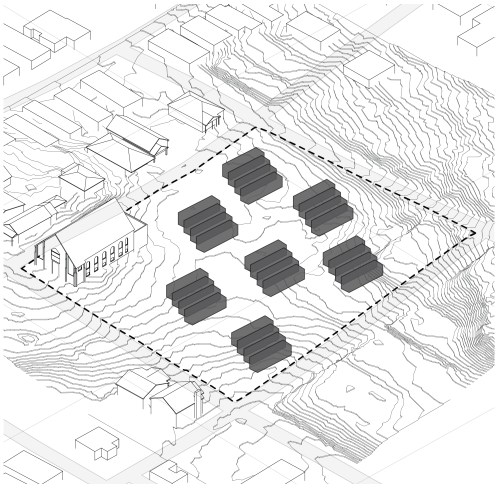


strategic move 2 - drawing alignments from the surrounding context: guidelines and obliques from adjacent buildings and the church can allow for a system that is embedded within the immediate local community.

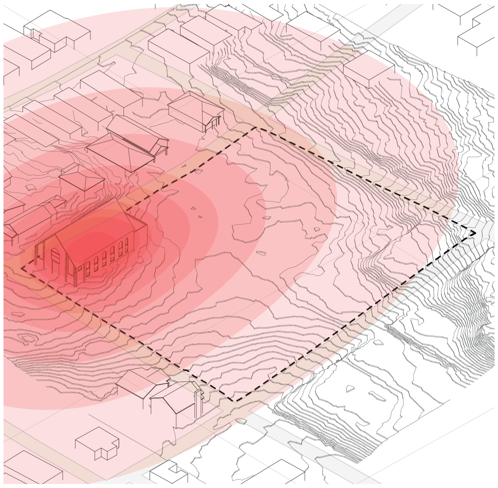


strategic move 3 - minimizing solar exposure and solar gain: strategic placement and clustering of modules could provide for minimal solar heat gain during the depressing heat of the summer. this clustering should also provide for naturally cooled exterior corridors. existing tree canopies must factor into this strategy. existing areas of high solar gain can be leveraged to harness solar energy to power the site.

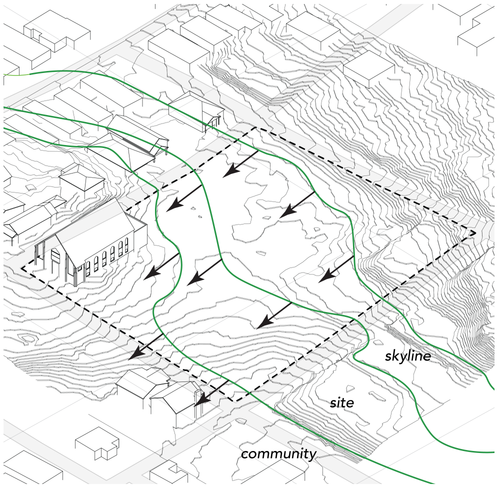




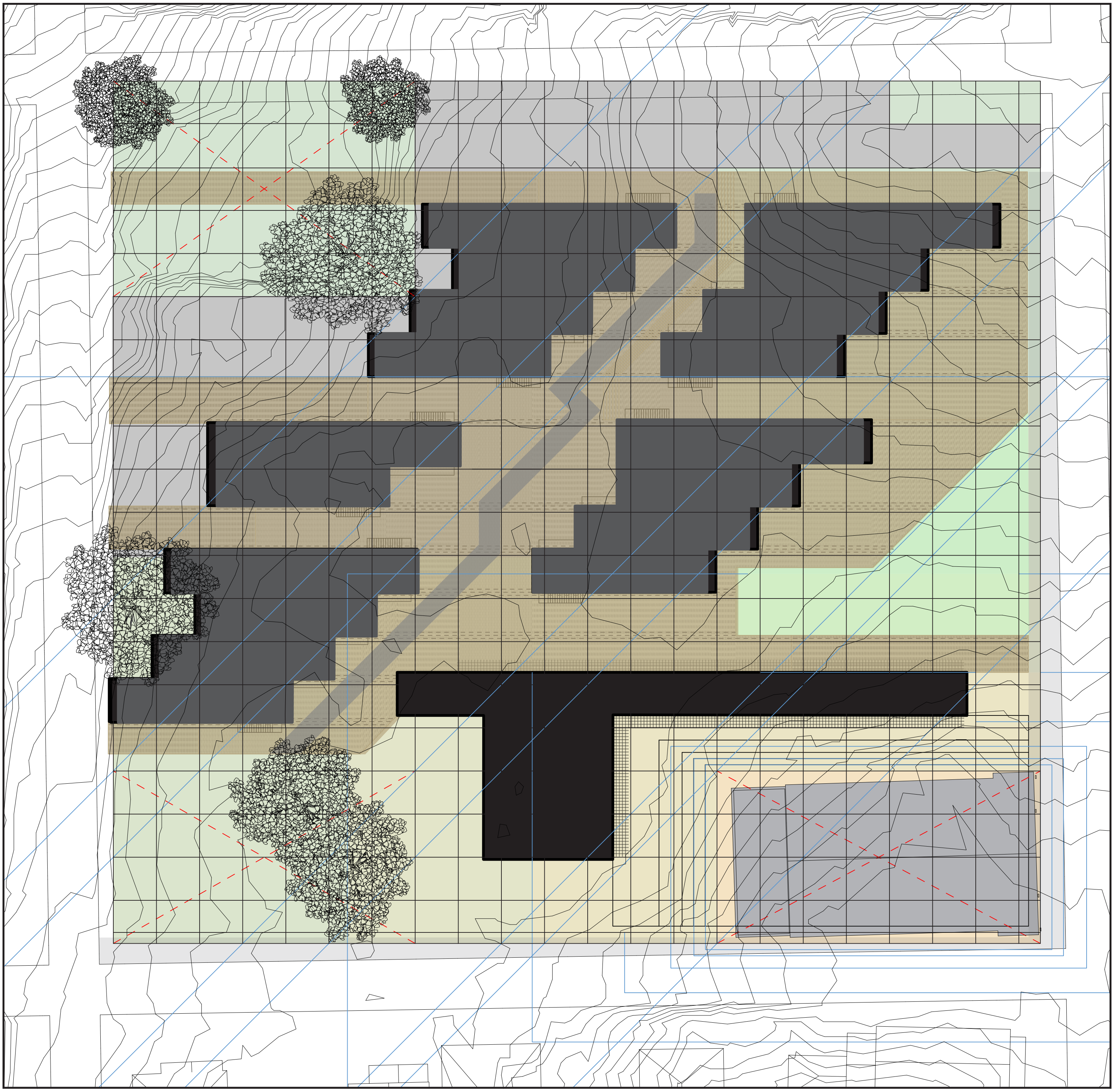
strategic move 4 - organizing dwelling units into variable clusters: clusters should be able to stack and offset from each other to provide for varied exterior geometries and flexibility to the site over time. such clusters provide for a social unit that can foster community growth.



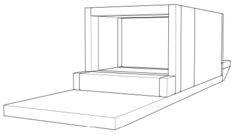
strategic move 5 - centralizing community around the Church: the Church should act as a social well and attractor node for the community, with community-focused spaces centralized around the historic structure with more individual-focused activities radiating outwards.



strategic move 6 - creating diverse environments through existing topographies: existing contours should be utilized to organize the views of the site. this organization would develop drastically different environments between the more skyline-oriented views of the western side of the site to the more community-oriented views of the eastern side.

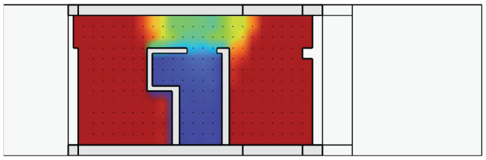


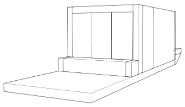
parti diagram

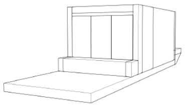


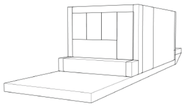
baseline

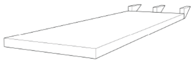
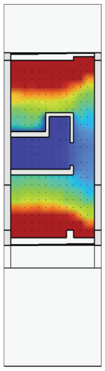
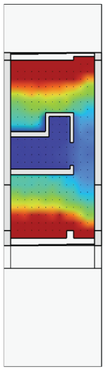
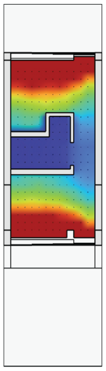
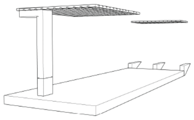
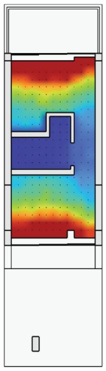
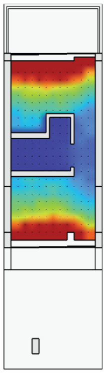
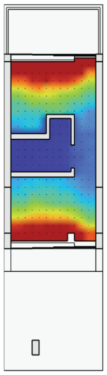
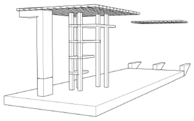
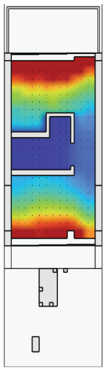
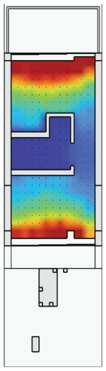
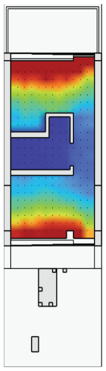
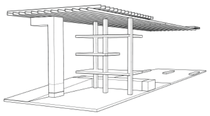
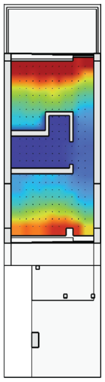
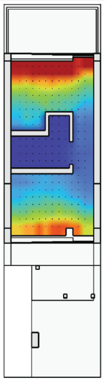
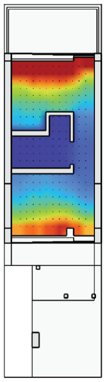
fully exposed east and west walls

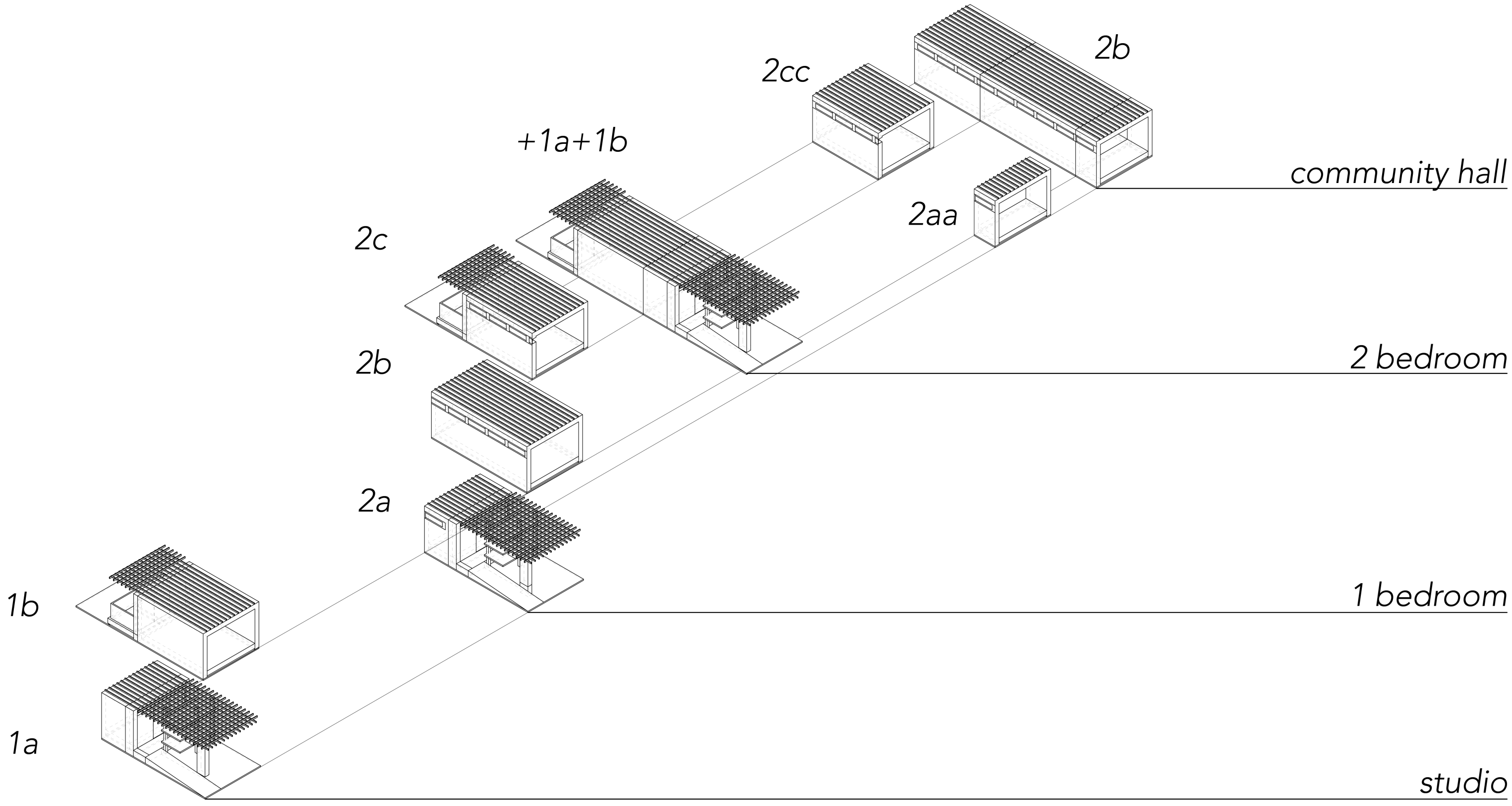


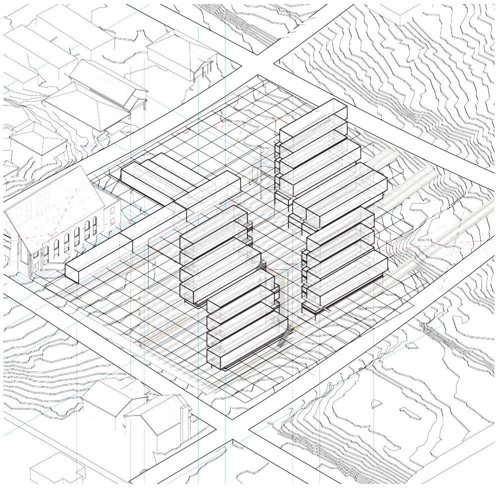


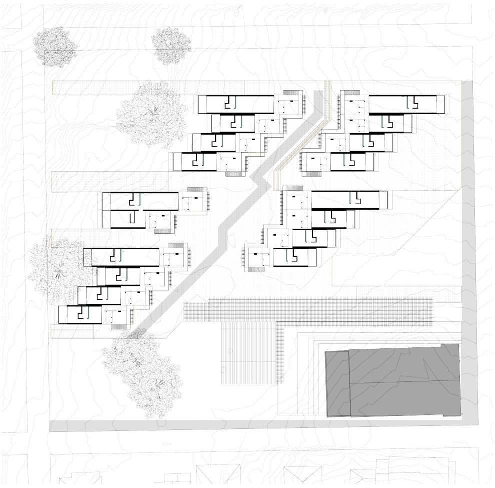




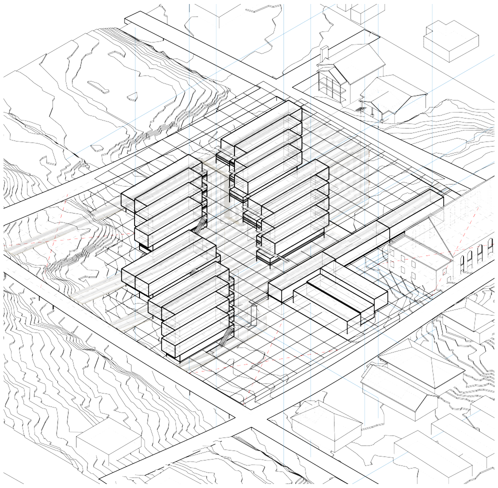
	floor-to-ceiling sliding glass doors	*sliding glass doors + overhang*	*ribbon window + sliding glass door*
no external features 			
added canopy + support 			
+ added light shelves 			
+ modified light shelves 			

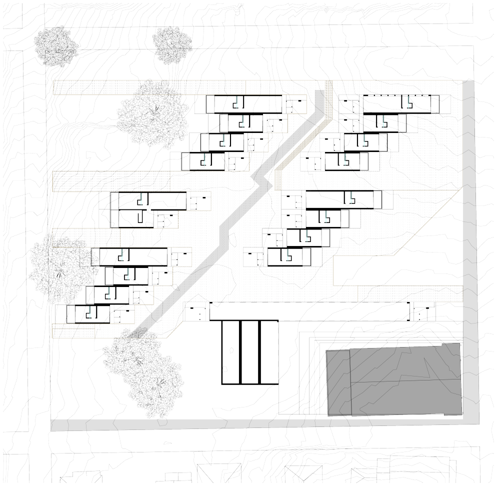






above - modular axonometric assembly: the diagram above demonstrates the tripartite division of the module, providing configurations for a studio, one bedroom, and two bedroom unit. these components also were utilized in the development of the form of the community center.

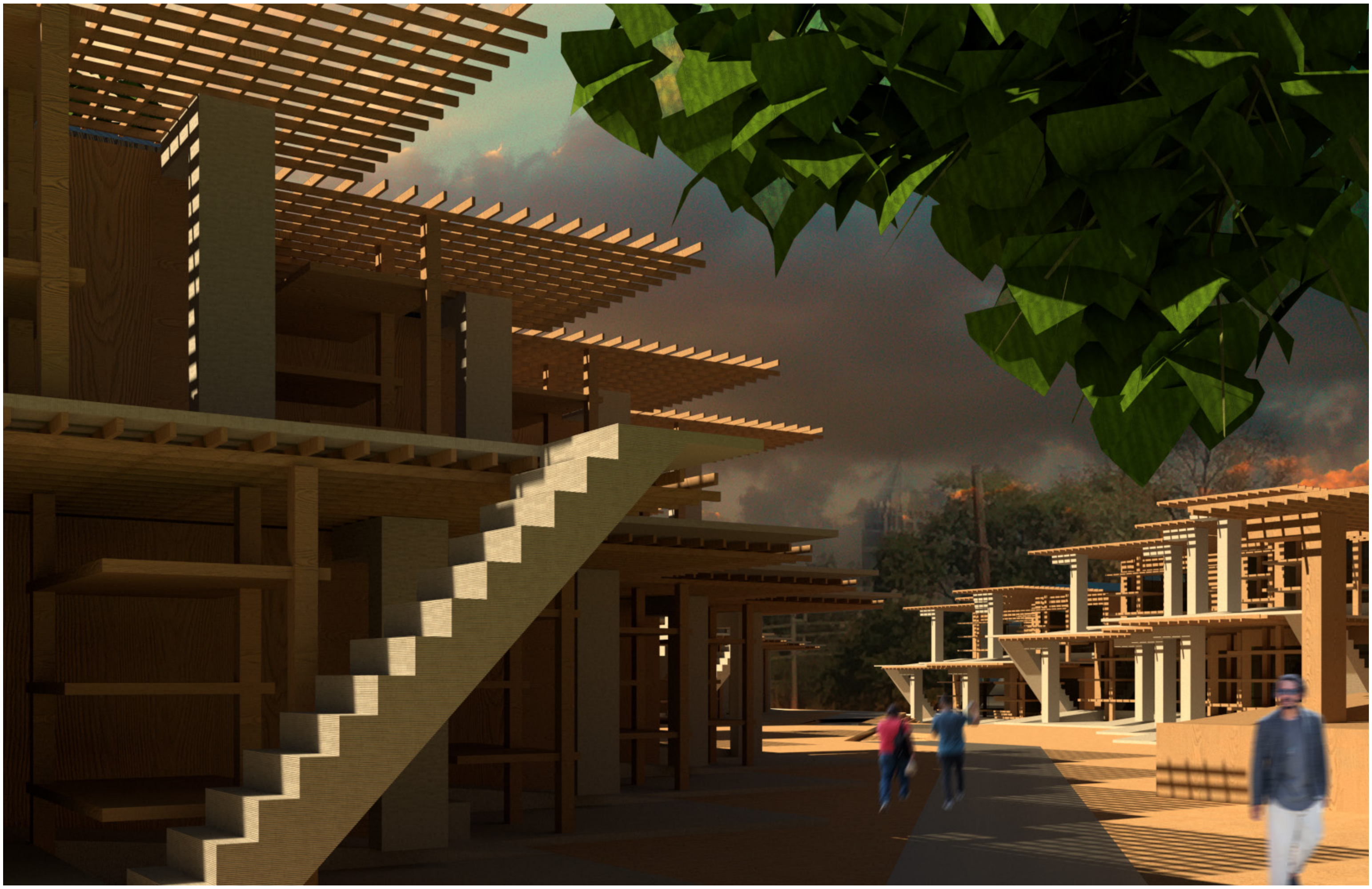


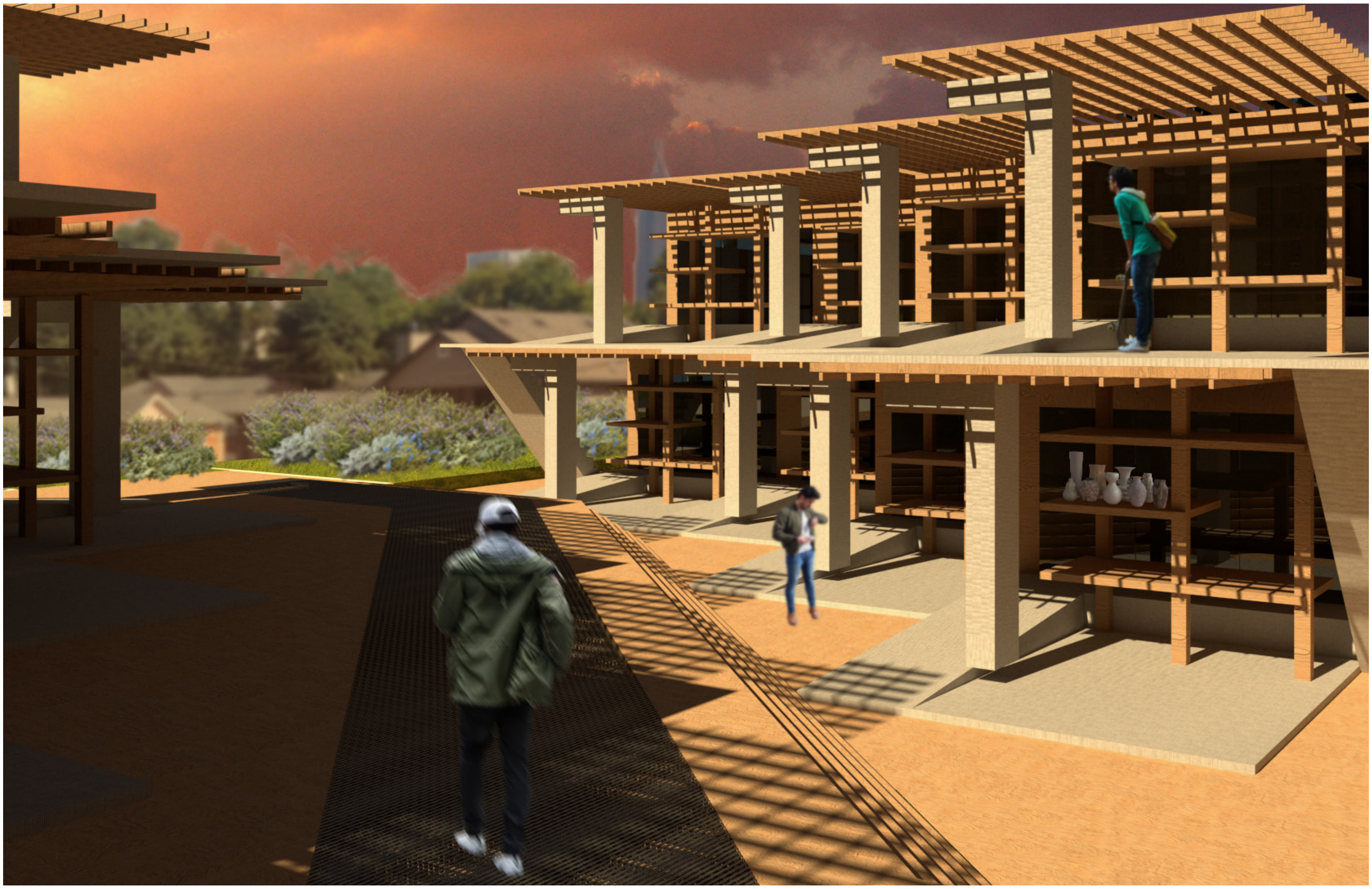


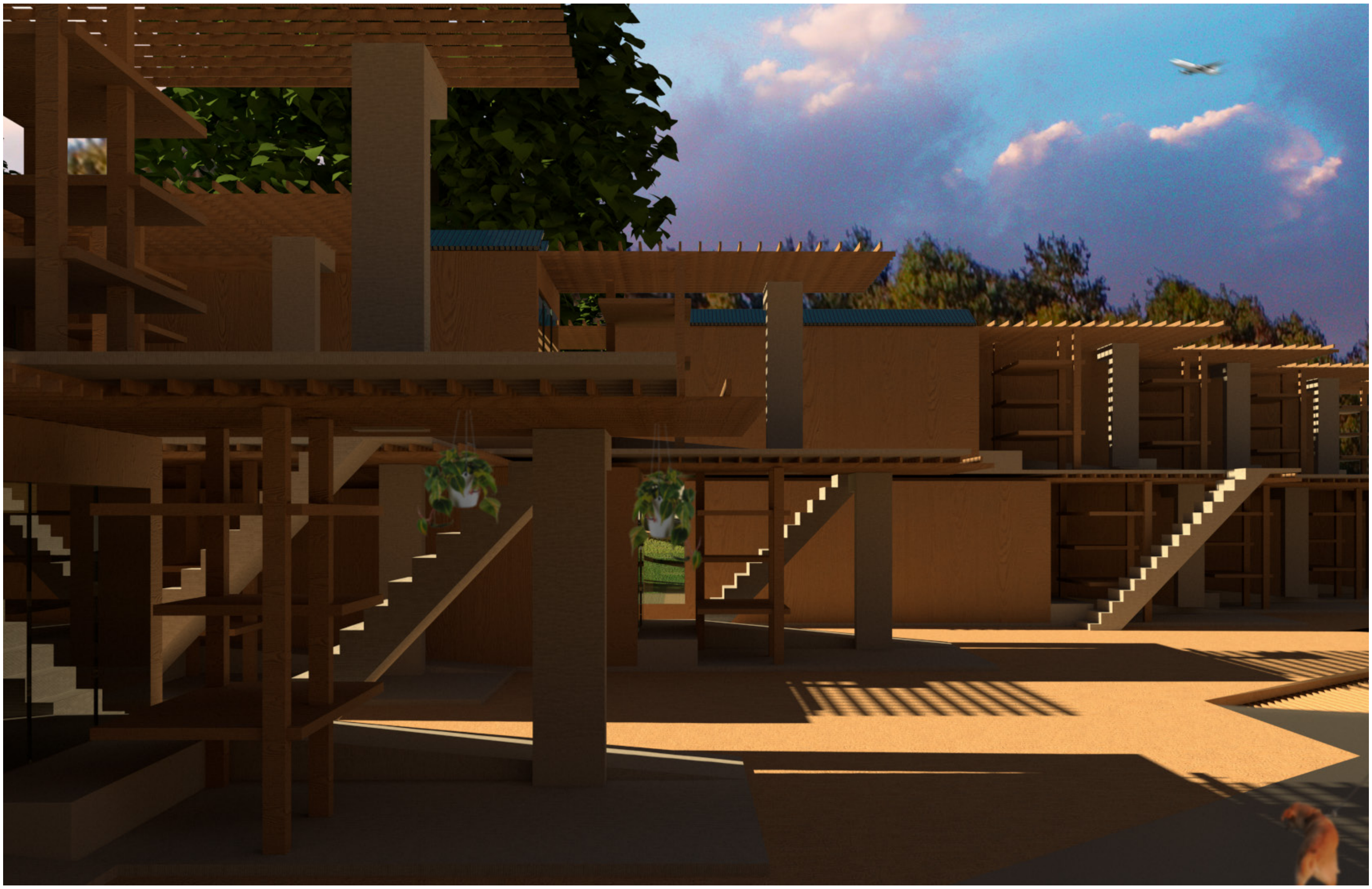
opposite page - climate studio analysis: module design was determined through a series of daylight availability analyses to determine optimal shading devices and shading strategies for the east-west wall.

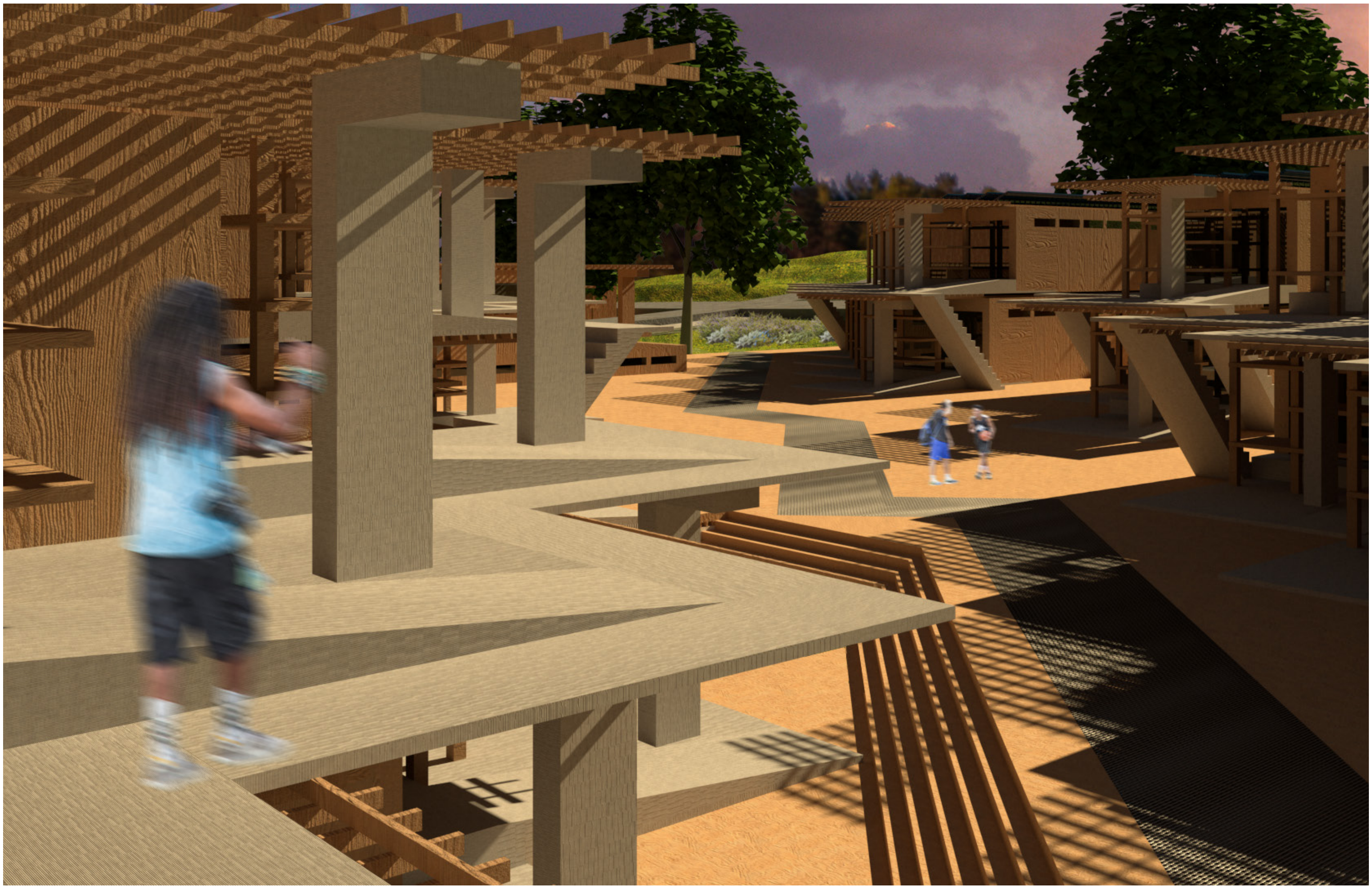
far left: site parti axons (from the northwest - top, from the southeast - bottom)

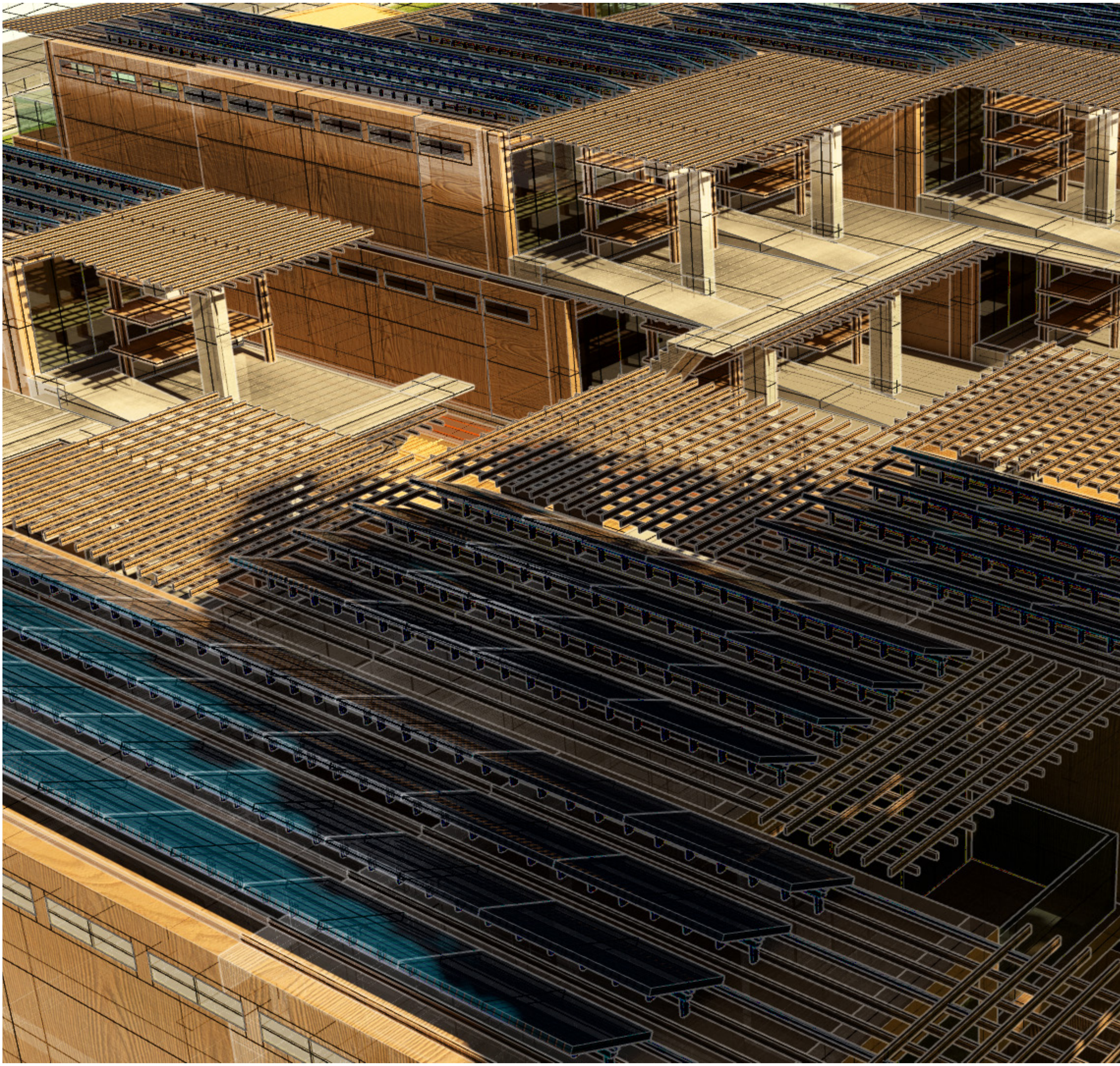
near left: building floor plans (upper level - top, bottom level - bottom)

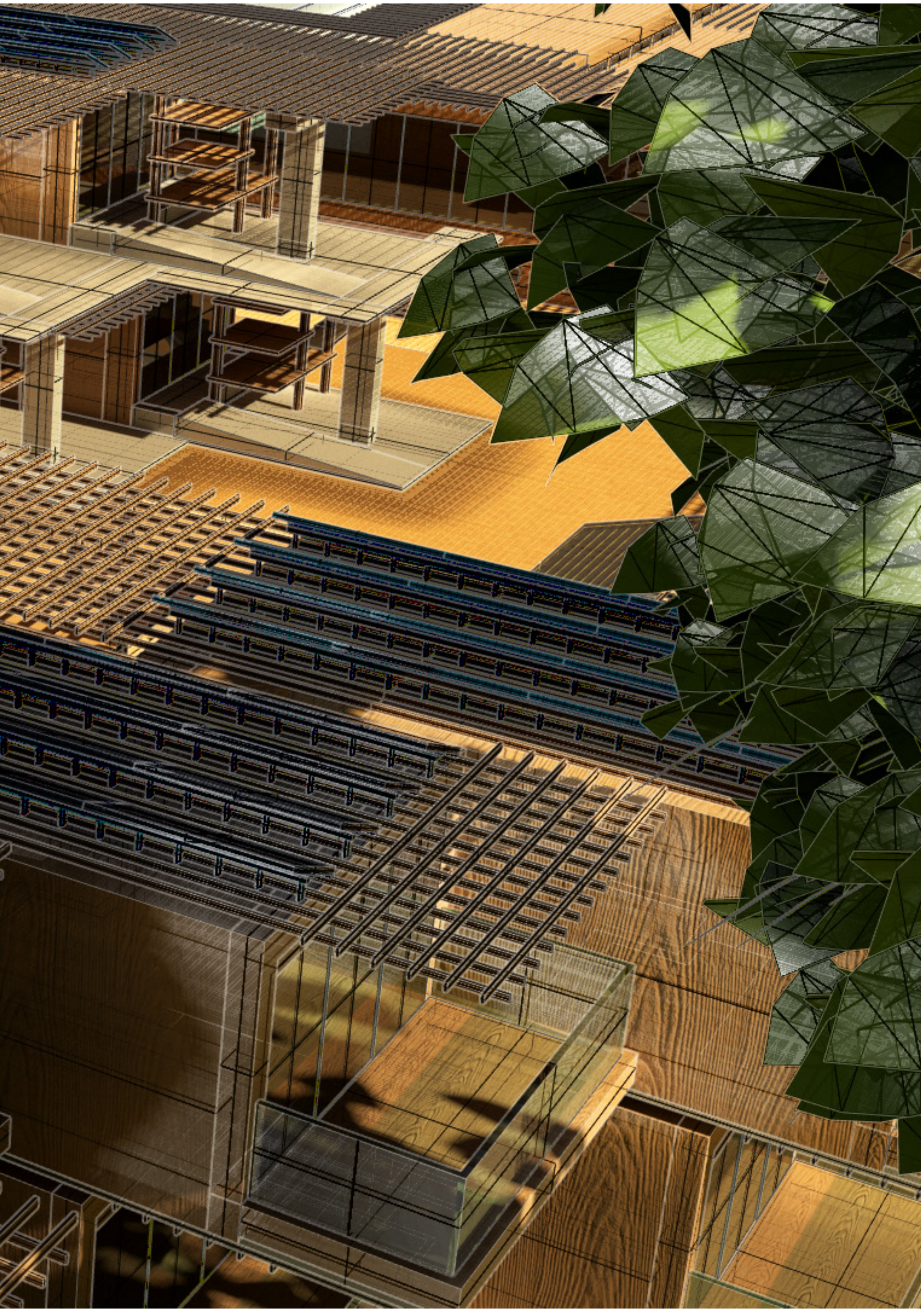








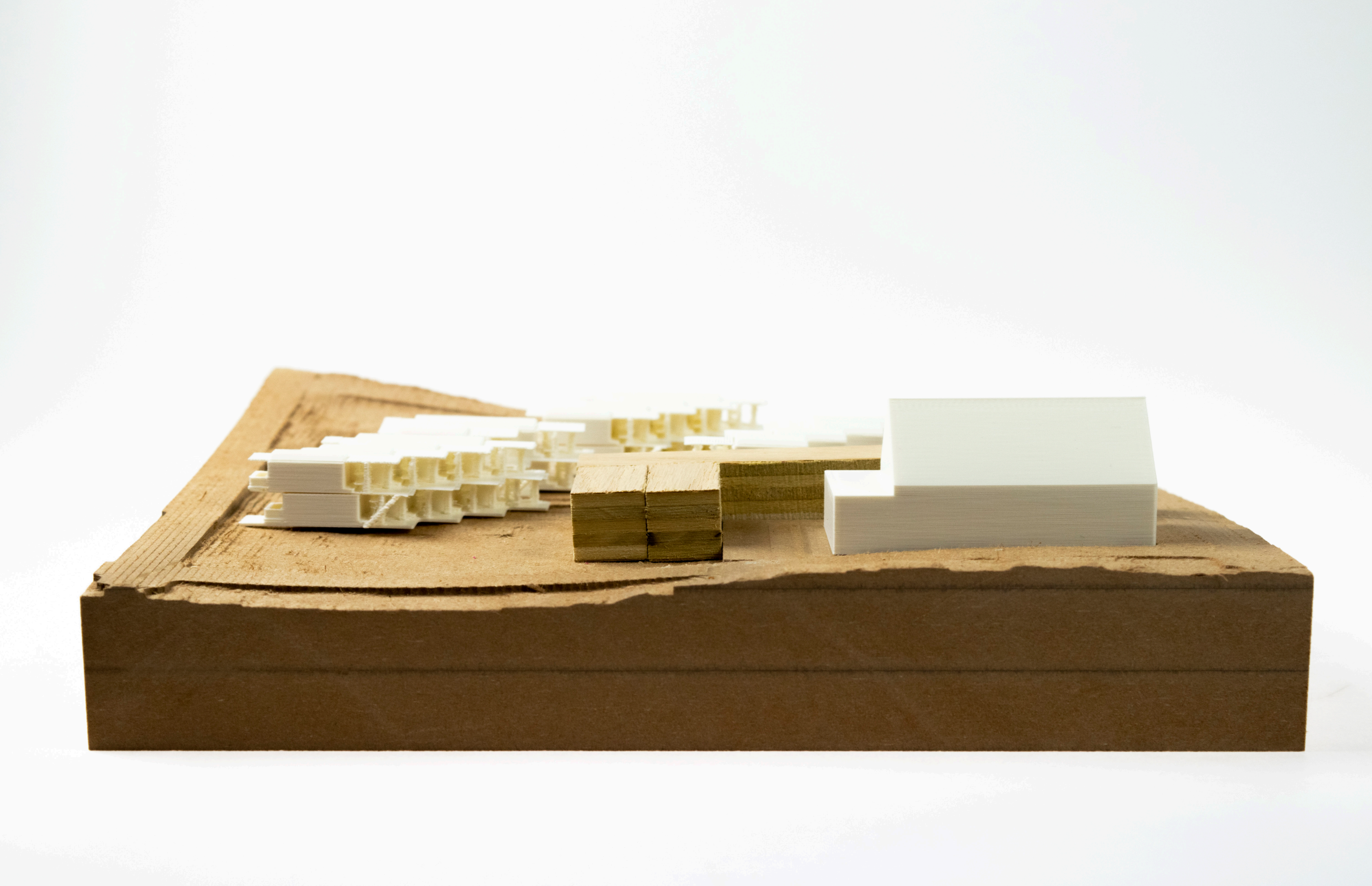


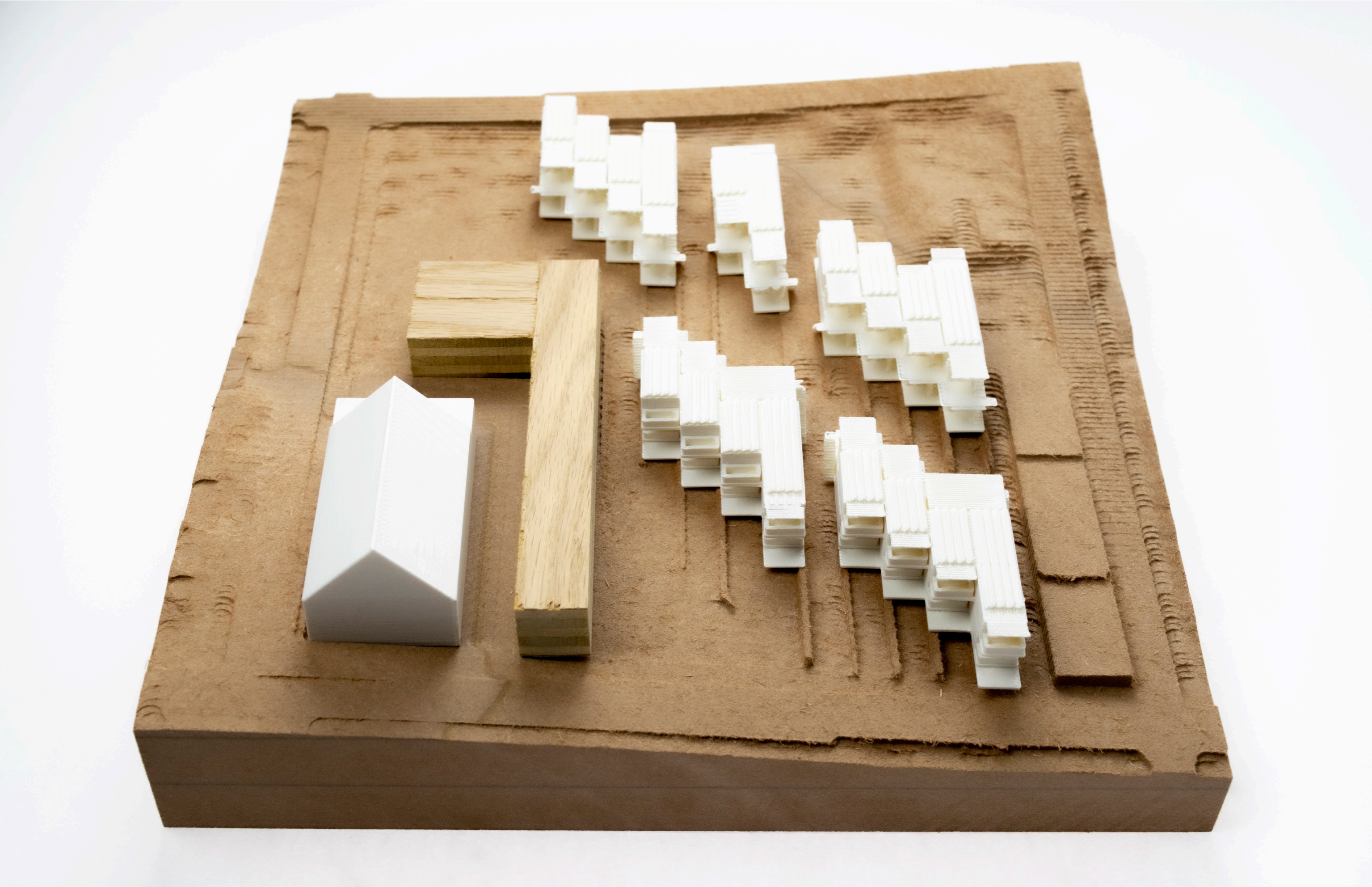


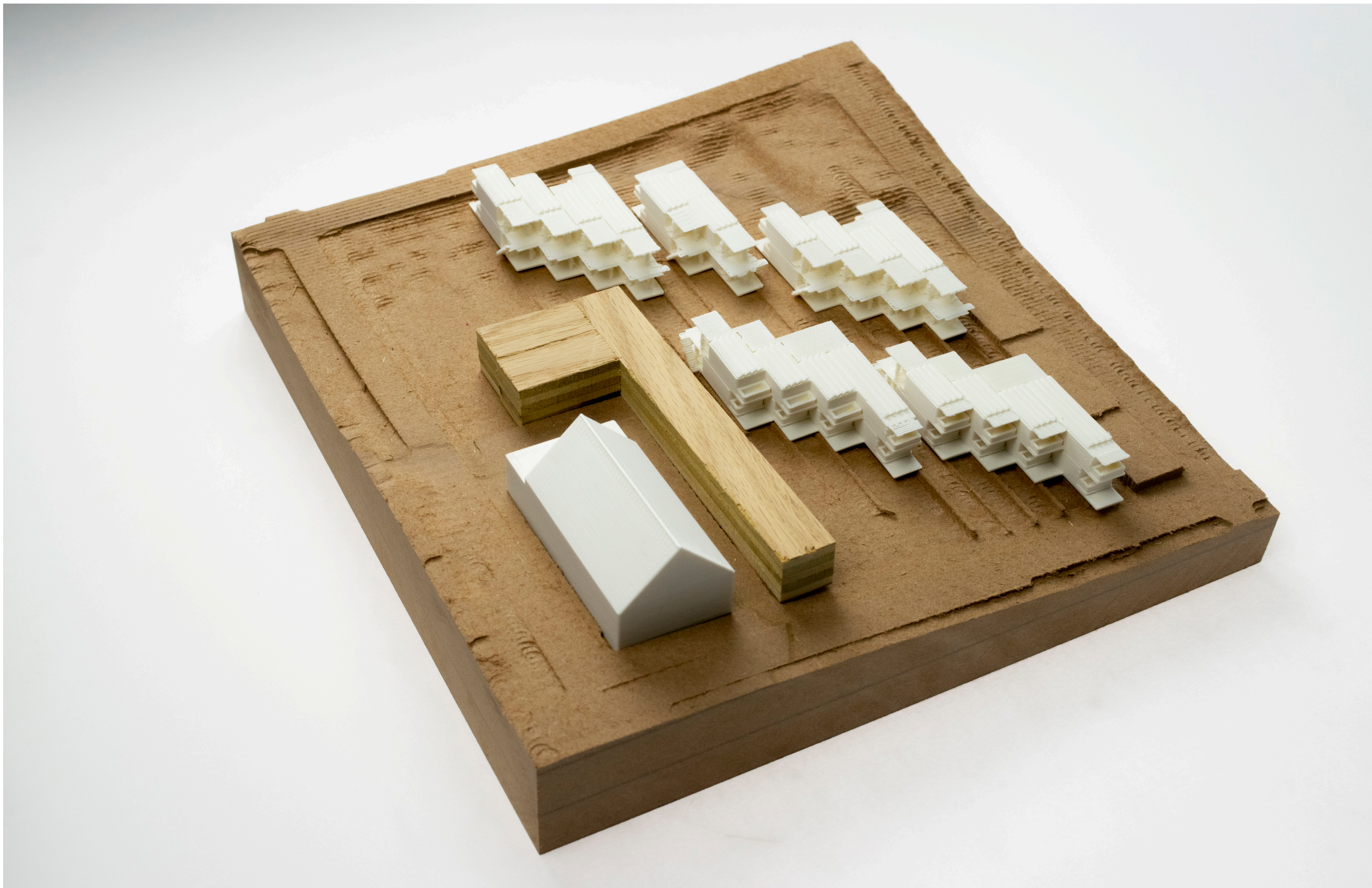
previous spread: filmic sequence walking through the project from foundry street to the northwest and onto the second level.

current spread: perspective view of the interweaving elements in spliced render modes, as seen from the northeast.

next spread: final site model photos. site model constructed at 1/32" = 1'. (mdf cnc-cut, basswood, 3d printing)



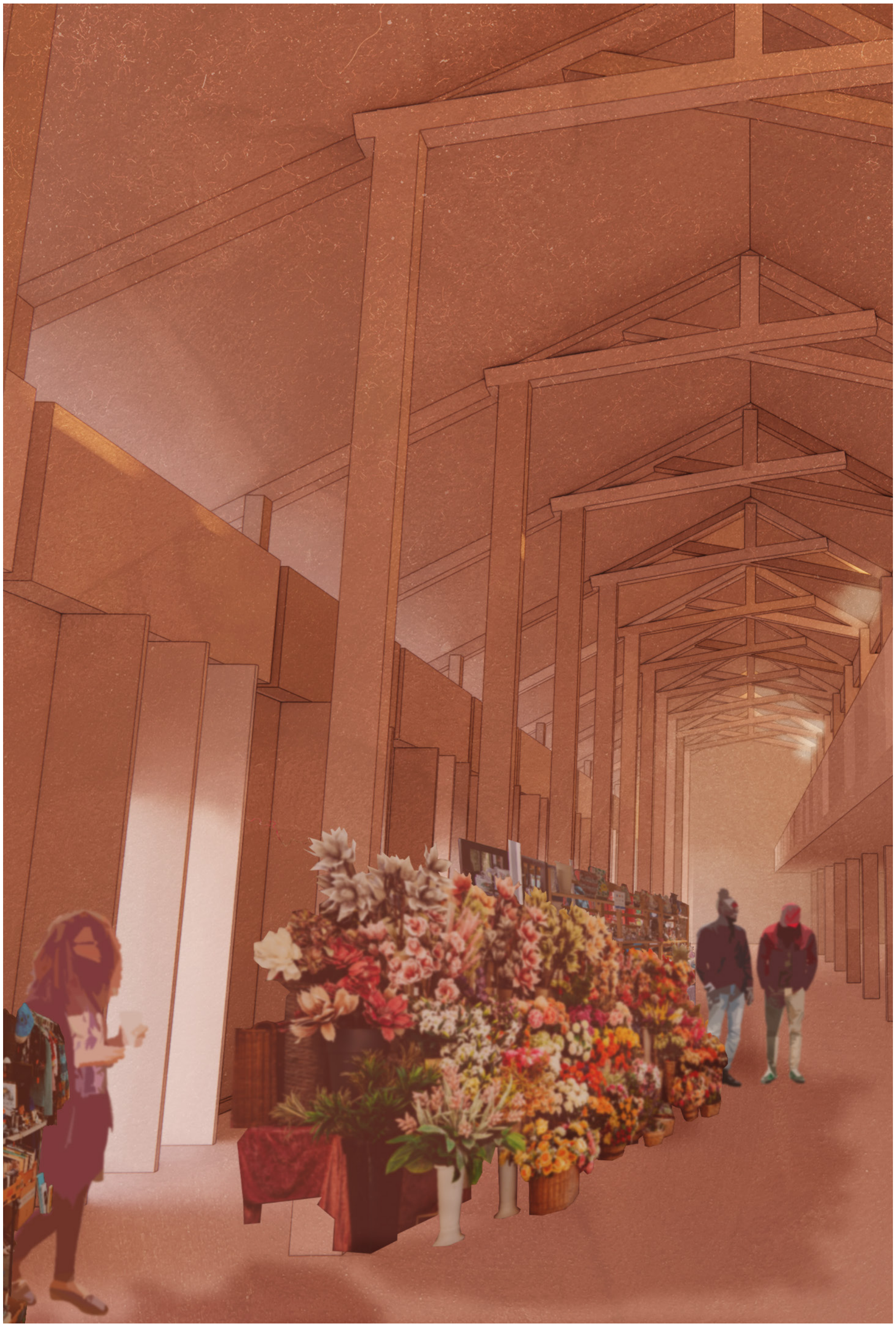




right: perspective view inside of the atrium of the mayersville community center. this flexible, multi-purpose space allows for a rich variety of programming for the needs of the town.

next page: research mappings depicting the solar (top) and wind (bottom) potential for mayersville and the surrounding areas. mayersville was found to have one of the highest solar energy potentials in the region, with a sizeable future potential in wind.

research done in collaboration with shaun enwright, keyhan khaki, dillon lejeune, and isaiah wilson



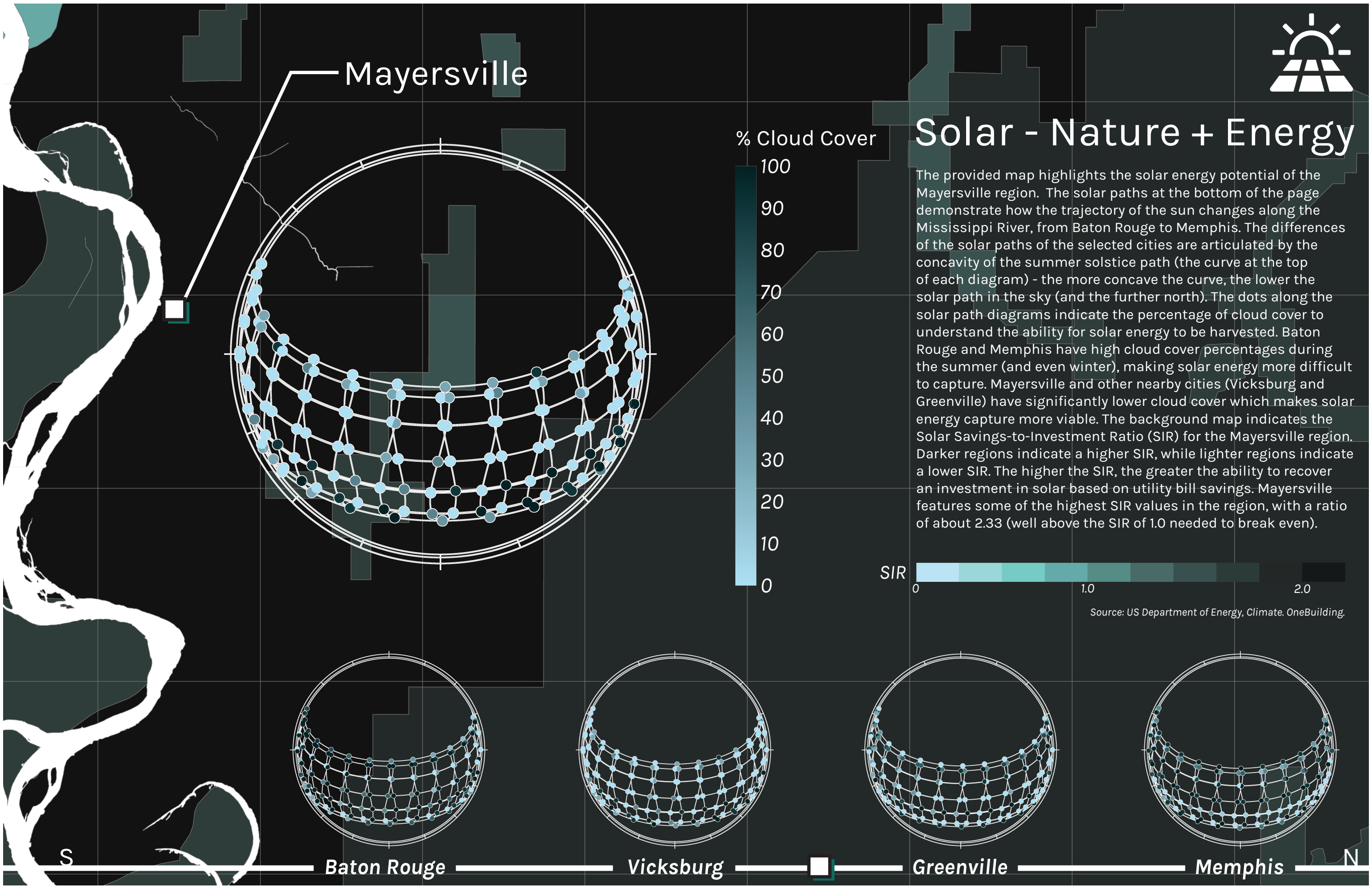
mayersville, ms

on the banks of the mississippi river lies the small town of mayersville. despite its modest appearance, the town lies at the center of issues beleaguring middle america: racial justice; equal access to education, food, health, and childcare; diversifying rural economies; affordable housing; and maintaining community as younger generations migrate to urban areas for better opportunities. this project recognized the immense potential that the town of mayersville currently has — a distinct civic core, a rich historical and cultural history, an identifying feature (the levee), and a rich ecosystem — and amplified these into a cohesive town language. by remaking its civic core into a mixed-use hub of social activity, anchored by a flexible community space for grassroots organizing and social events, this proposal creates a renewed sense of place while coalescing the local community and incubating small businesses. additionally, by employing modular housing units utilizing vernacular elements and passive design strategies, this proposal creates affordable housing options while allowing residents to age in place. finally, by raising the roads of mayersville and establishing a system of restored wetlands, this proposal provides a sense of stability and safety while addressing seepage flooding concerns.

rekindling the core

building community in mayersville

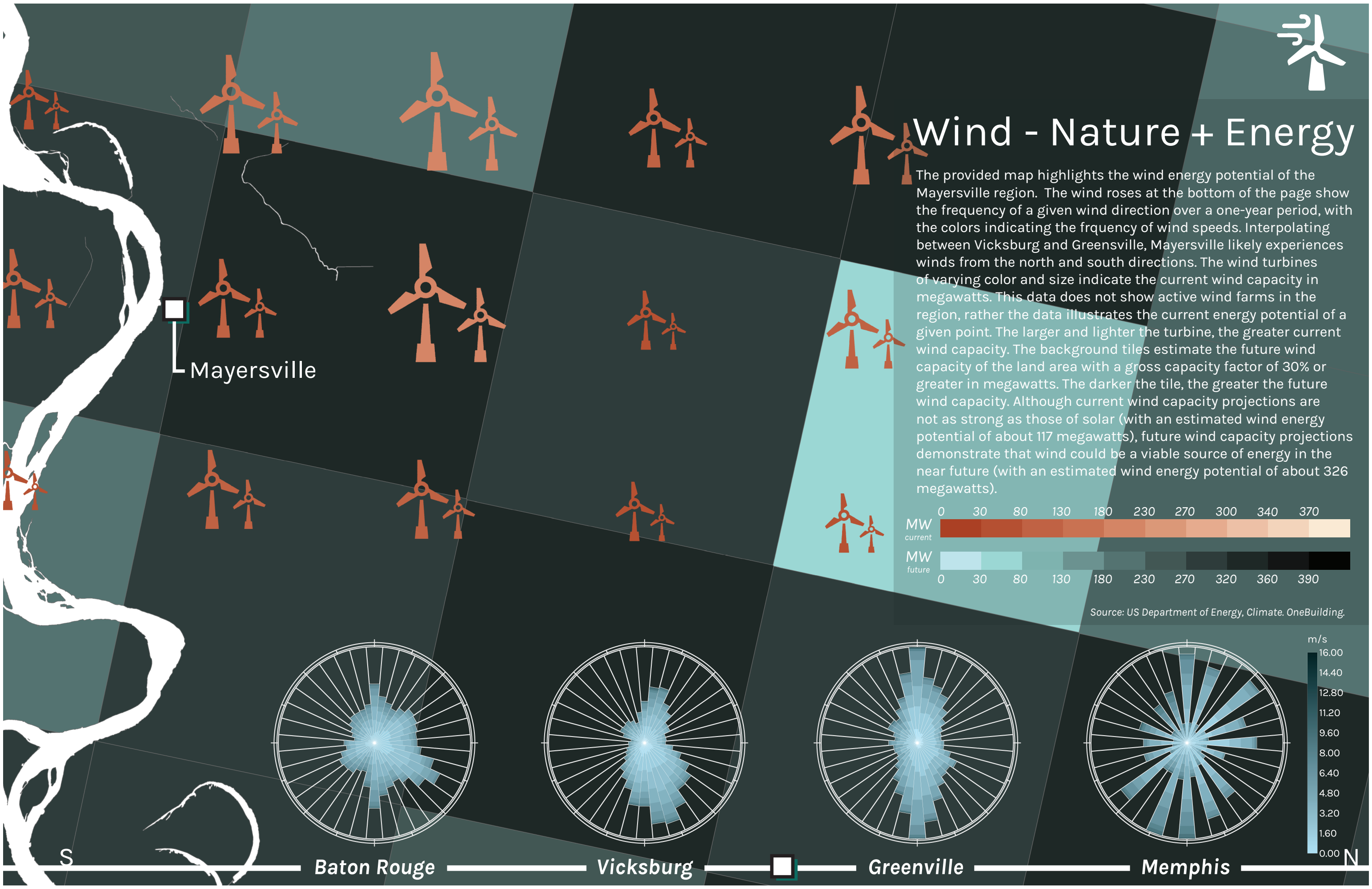
arch6040: advanced studio 2
professor charles rudolph
spring 2022


Mayersville
% Cloud Cover
100
90
80
70
60
50
40
30
20
10
0
SIR
0
1.0
2.0
S
Baton Rouge
Vicksburg
Greenville
Memphis
N

Solar - Nature + Energy

The provided map highlights the solar energy potential of the Mayersville region. The solar paths at the bottom of the page demonstrate how the trajectory of the sun changes along the Mississippi River, from Baton Rouge to Memphis. The differences of the solar paths of the selected cities are articulated by the concavity of the summer solstice path (the curve at the top of each diagram) - the more concave the curve, the lower the solar path in the sky (and the further north). The dots along the solar path diagrams indicate the percentage of cloud cover to understand the ability for solar energy to be harvested. Baton Rouge and Memphis have high cloud cover percentages during the summer (and even winter), making solar energy more difficult to capture. Mayersville and other nearby cities (Vicksburg and Greenville) have significantly lower cloud cover which makes solar energy capture more viable. The background map indicates the Solar Savings-to-Investment Ratio (SIR) for the Mayersville region. Darker regions indicate a higher SIR, while lighter regions indicate a lower SIR. The higher the SIR, the greater the ability to recover an investment in solar based on utility bill savings. Mayersville features some of the highest SIR values in the region, with a ratio of about 2.33 (well above the SIR of 1.0 needed to break even).

Source: US Department of Energy, Climate. OneBuilding.


Mayersville
MW
current
0
30
80
130
180
230
270
300
340
370
MW
future
0
30
80
130
180
230
270
320
360
390
m/s
16.00
14.40
12.80
11.20
9.60
8.00
6.40
4.80
3.20
1.60
0.00
S
Baton Rouge
Vicksburg
Greenville
Memphis
N

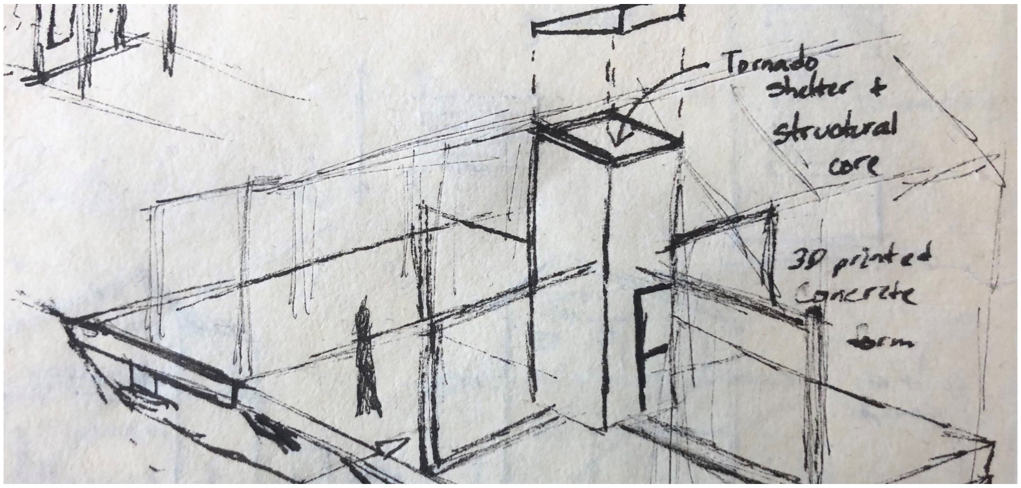
Wind - Nature + Energy

The provided map highlights the wind energy potential of the Mayersville region. The wind roses at the bottom of the page show the frequency of a given wind direction over a one-year period, with the colors indicating the frquency of wind speeds. Interpolating between Vicksburg and Greensville, Mayersville likely experiences winds from the north and south directions. The wind turbines of varying color and size indicate the current wind capacity in megawatts. This data does not show active wind farms in the region, rather the data illustrates the current energy potential of a given point. The larger and lighter the turbine, the greater current wind capacity. The background tiles estimate the future wind capacity of the land area with a gross capacity factor of 30% or greater in megawatts. The darker the tile, the greater the future wind capacity. Although current wind capacity projections are not as strong as those of solar (with an estimated wind energy potential of about 117 megawatts), future wind capacity projections demonstrate that wind could be a viable source of energy in the near future (with an estimated wind energy potential of about 326 megawatts).

Source: US Department of Energy, Climate. OneBuilding.

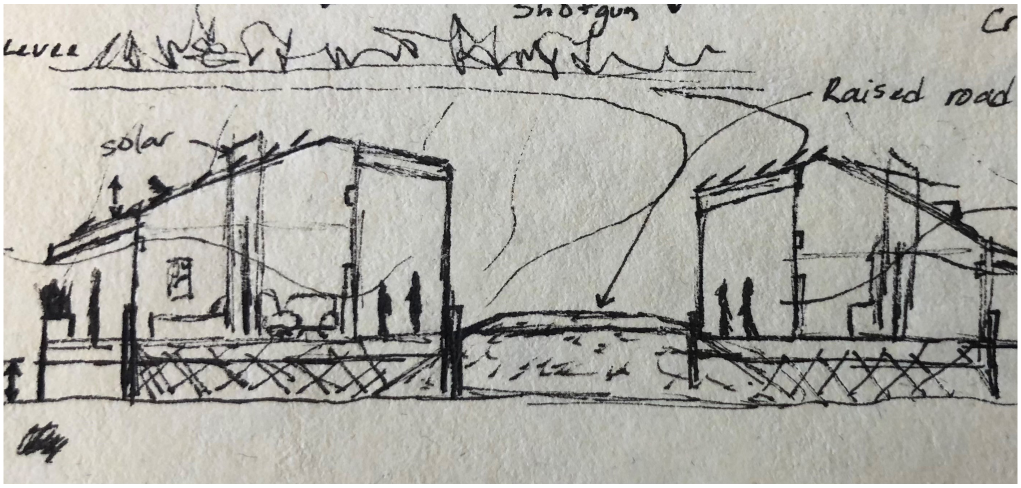
top half of page: concept sketches showing the early thought process when developing the modular residence. homes are divided into quadrants with a central core that can function as a tornado shelter. homes front the street with a porch, building upon a social and cultural framework prevalent throughout the american south.

bottom half of page: early rhino models depicting the means in which modules were constructed. the core and slab are the starting geometries of which guidelines build off of. once the form of the house has been established, two sets of quadrant based modules are produced — one with a more public function and one with a more private function.



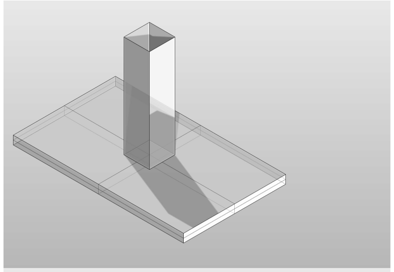
top half of next page: construction sequence of housing prototype 1. the sequence begins with the core (1), before adding piers (2), trusses (3), floor plates (4), railing and shading devices (5), and walls (6). lastly, the fenestration (7), water collection (8), and roof and solar panels are placed (9).

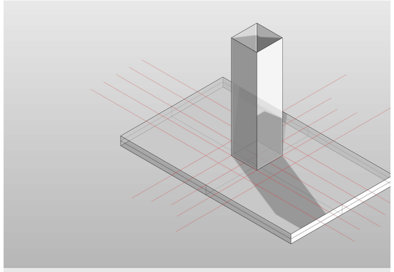
bottom half of next page: a section of housing prototype 1, originally drawn at 1 in = 8 ft, cut through the center of the core.

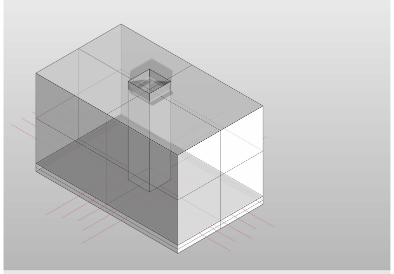


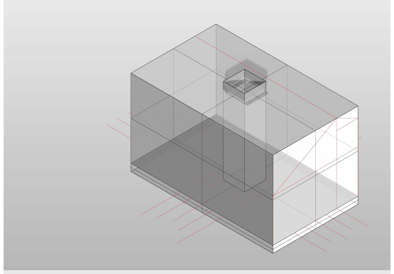
the residence

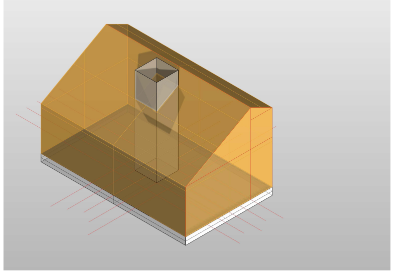
at the center of the residence is a 5x5 core, made of 3d-printed concrete which provides stability and safety to the domicile. the core is placed at the center of a 24x40 rectangular prism. along the short end of the prism, a gable is formed by a series of gridlines based upon a series of proportions and similar triangles, evoking the cottage creole typology. the gable, oriented north-south, provides opportunities for utilizing solar energy to power each residence. the 24x40 rectangular prism is sub-divided equally into four 12x20 quadrants, with the taller quadrants positioned to house more public functions and the shorter quadrants housing more private functions. one front quadrant and one rear quadrant was developed into its own module, allowing for a variety of unique combinations to cater towards individual needs. the CLT structure of the residence is articulated by a regular repetition of scissor trusses, creating a lofty interior to allow for cross ventilation opportunities. each module features a porch, with a public porch for neighborly interaction and a rear porch for scenic views. in the front, a series of mechanical roll-down shutters provides for privacy and shade. in the rear, swinging floor-to-ceiling shutters provide opportunities for views while retaining privacy. interior partitions allow for the delineation of space while providing access points for utilities.

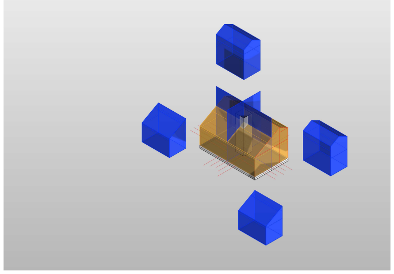

1 - Structural Form and Foundation

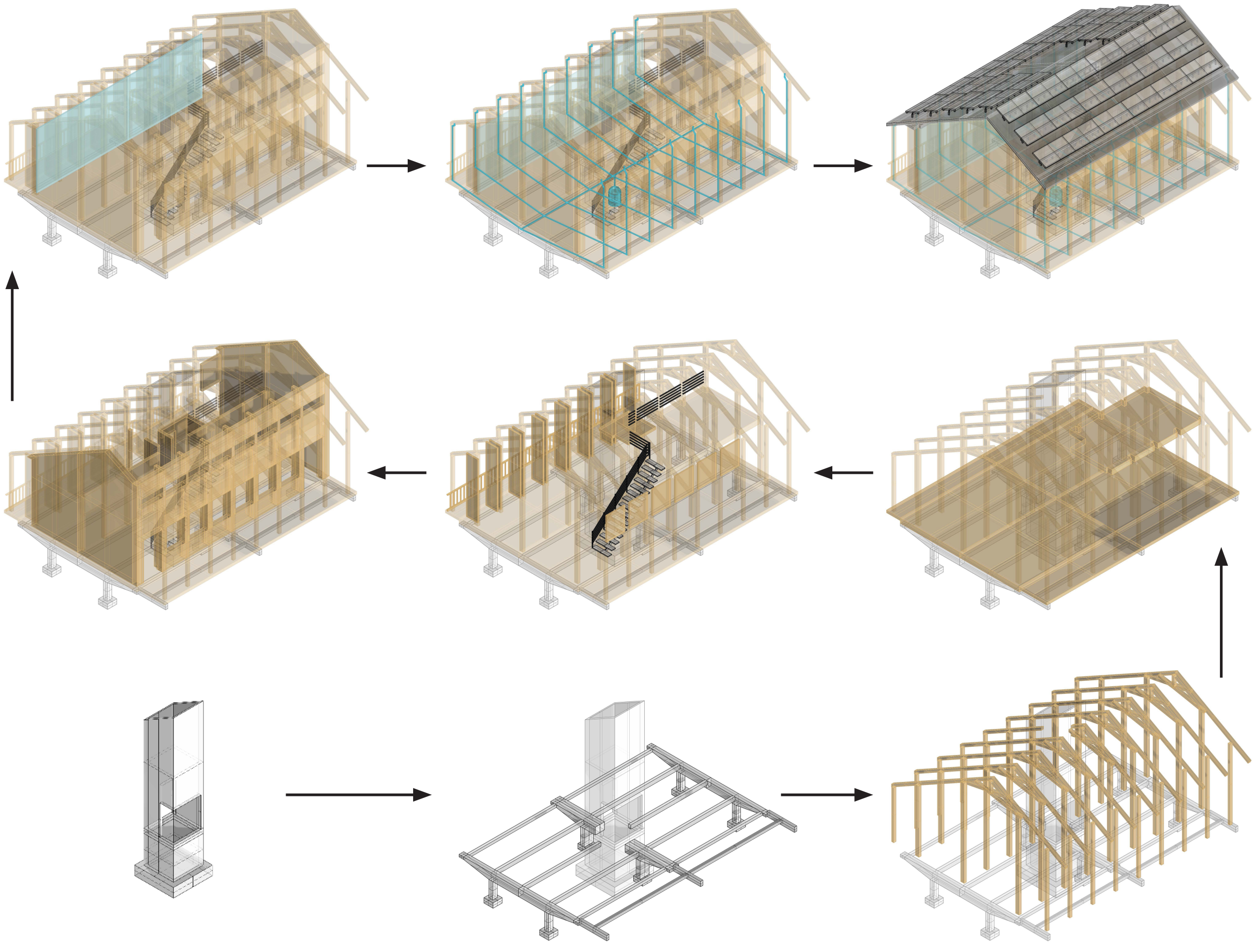

2 - Guidelines Dictating Form

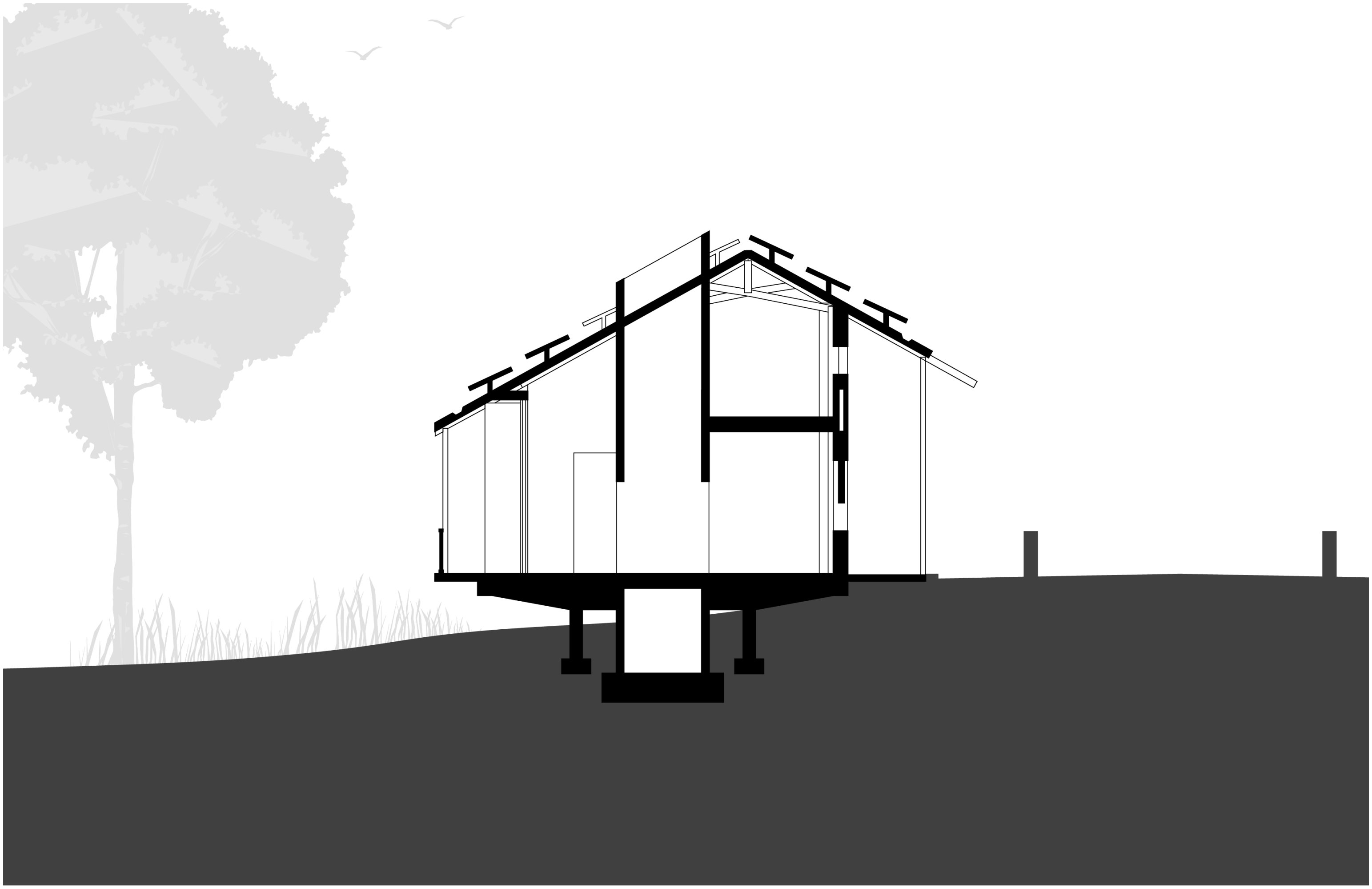

3 - House Volume

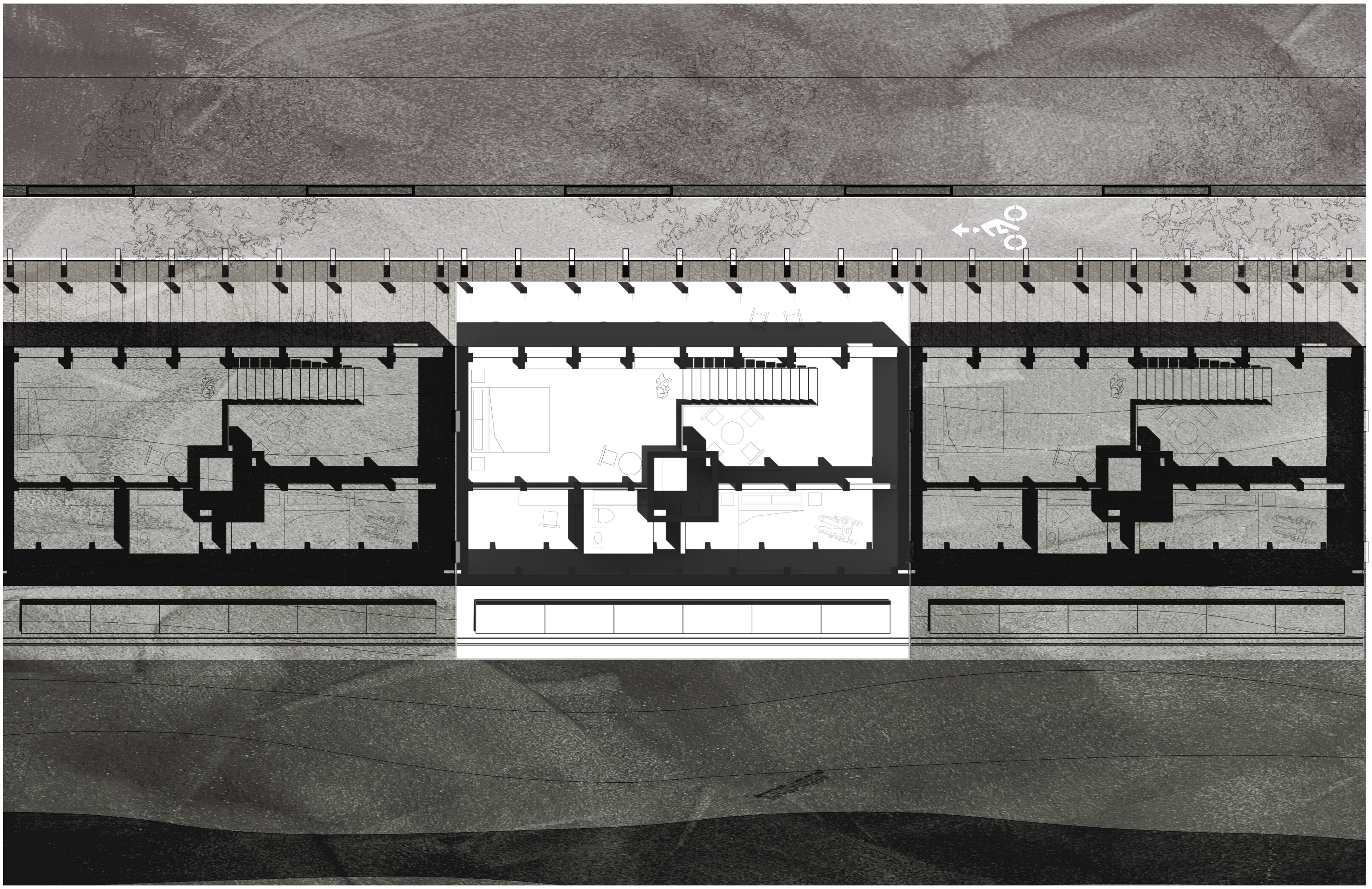

4 - Guidelines Dictate Gable

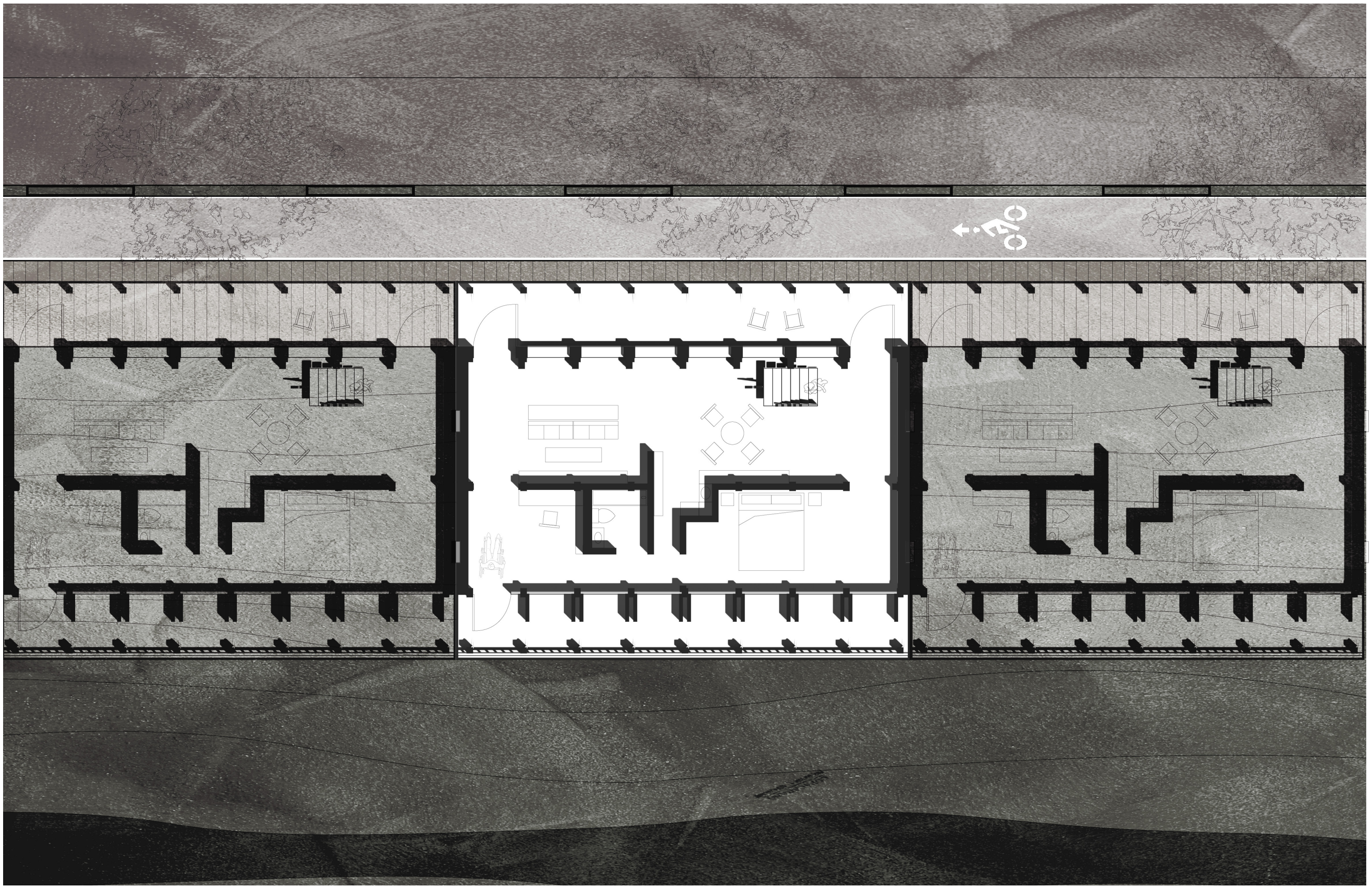

5 - House Form


6 - Quadrant-Based Modules



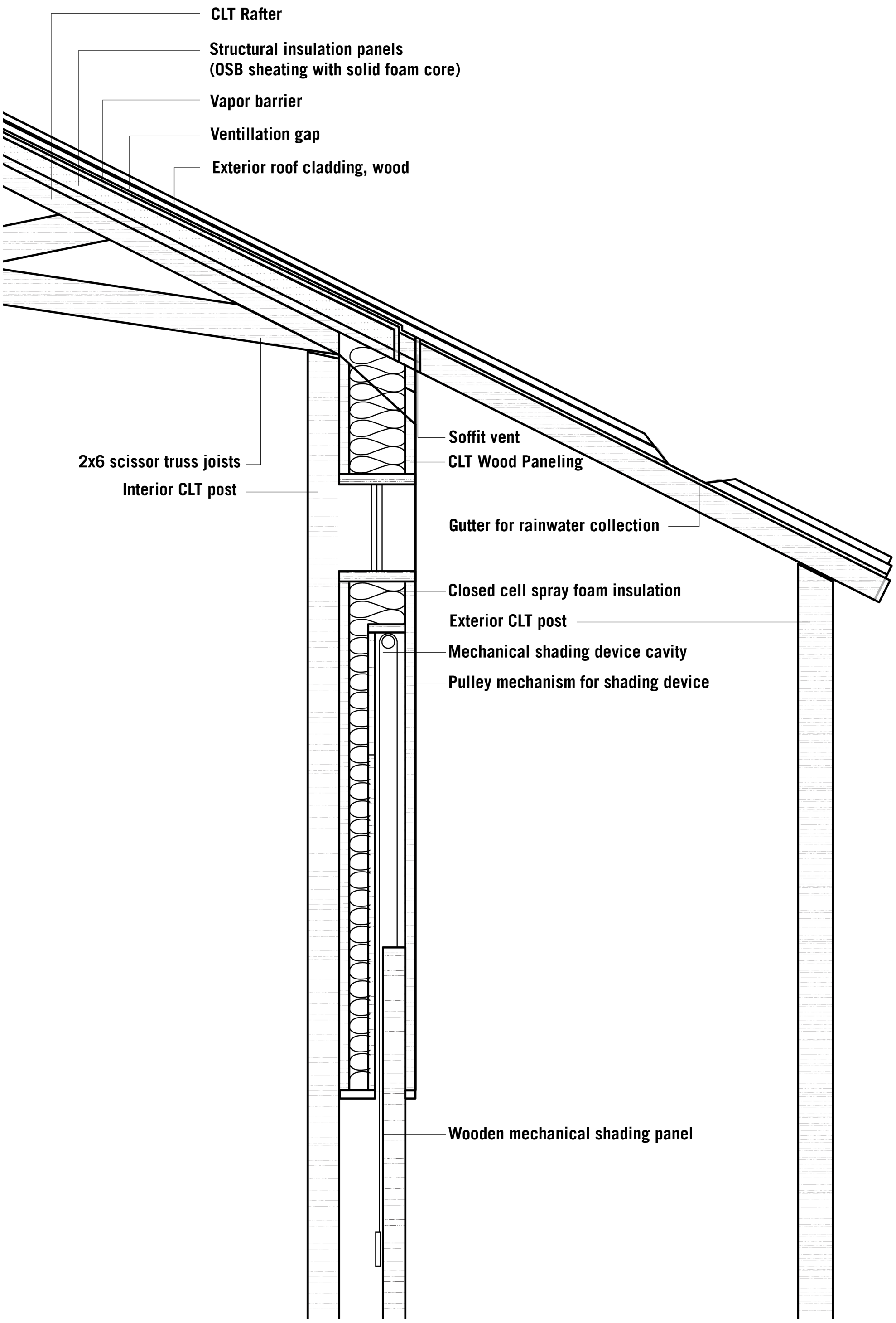




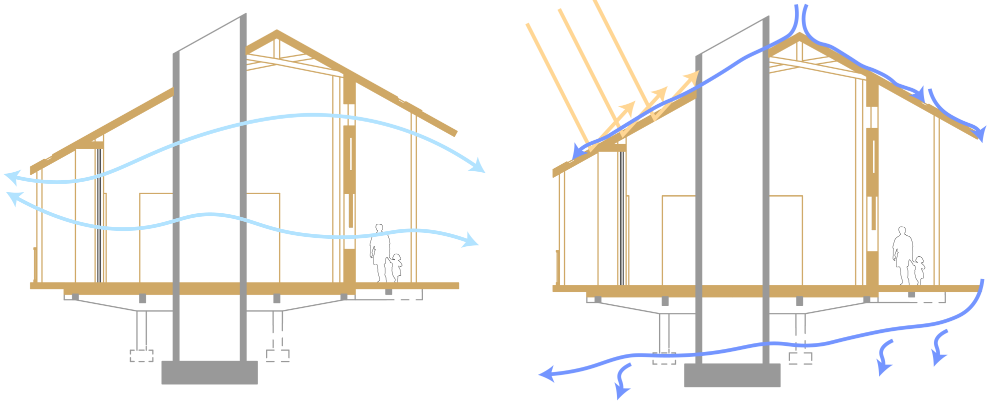


opposite page: floor plans for housing prototype 1, originally drawn at 1 in = 8 ft. the top plan features the upper level, while the bottom plan features the lower level.

left: a wall section of housing prototype 1 showing the connection between the wall and roof at the porch. of particular interest is the pulley mechanism, a flexible system for shading and privacy concerns.


CLT Rafter
Structural insulation panels
(OSB sheating with solid foam core)
Vapor barrier
Ventillation gap
Exterior roof cladding, wood
Soffit vent
2x6 scissor truss joists
CLT Wood Paneling
Interior CLT post
Gutter for rainwater collection
Closed cell spray foam insulation
Exterior CLT post
Mechanical shading device cavity
Pulley mechanism for shading device
Wooden mechanical shading panel

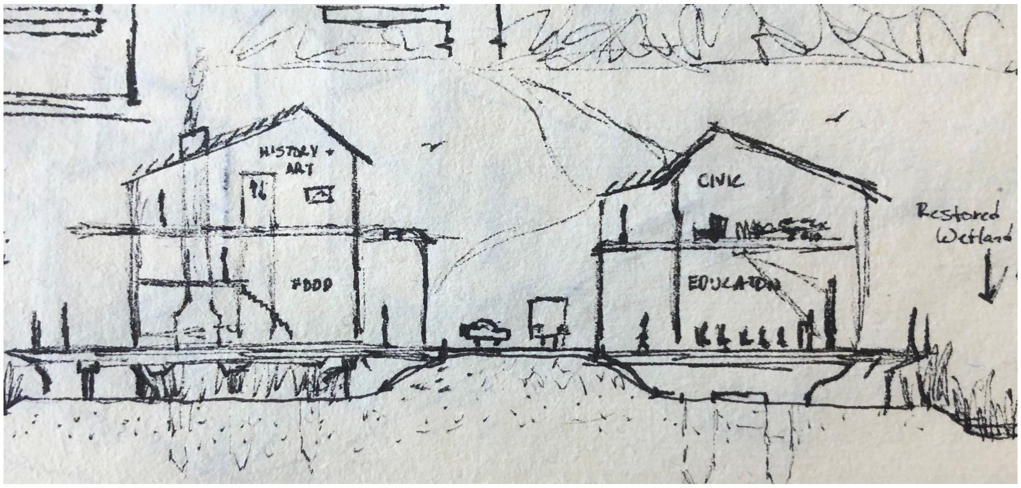
left: passive design strategies embedded in the design of housing prototype 1. the first image on the left shows how cross ventilation can be used to cool the home during warm and humid summer months. the region predominantly sees north-south winds and as such, openings are placed on the northern and southern facades to allow for air movement. the second image on the right depicts solar rays and water movement. the double porch system allows for minimal heat gain during the summer while also allowing for water capture into rainwater collection systems and adjacent wetlands.

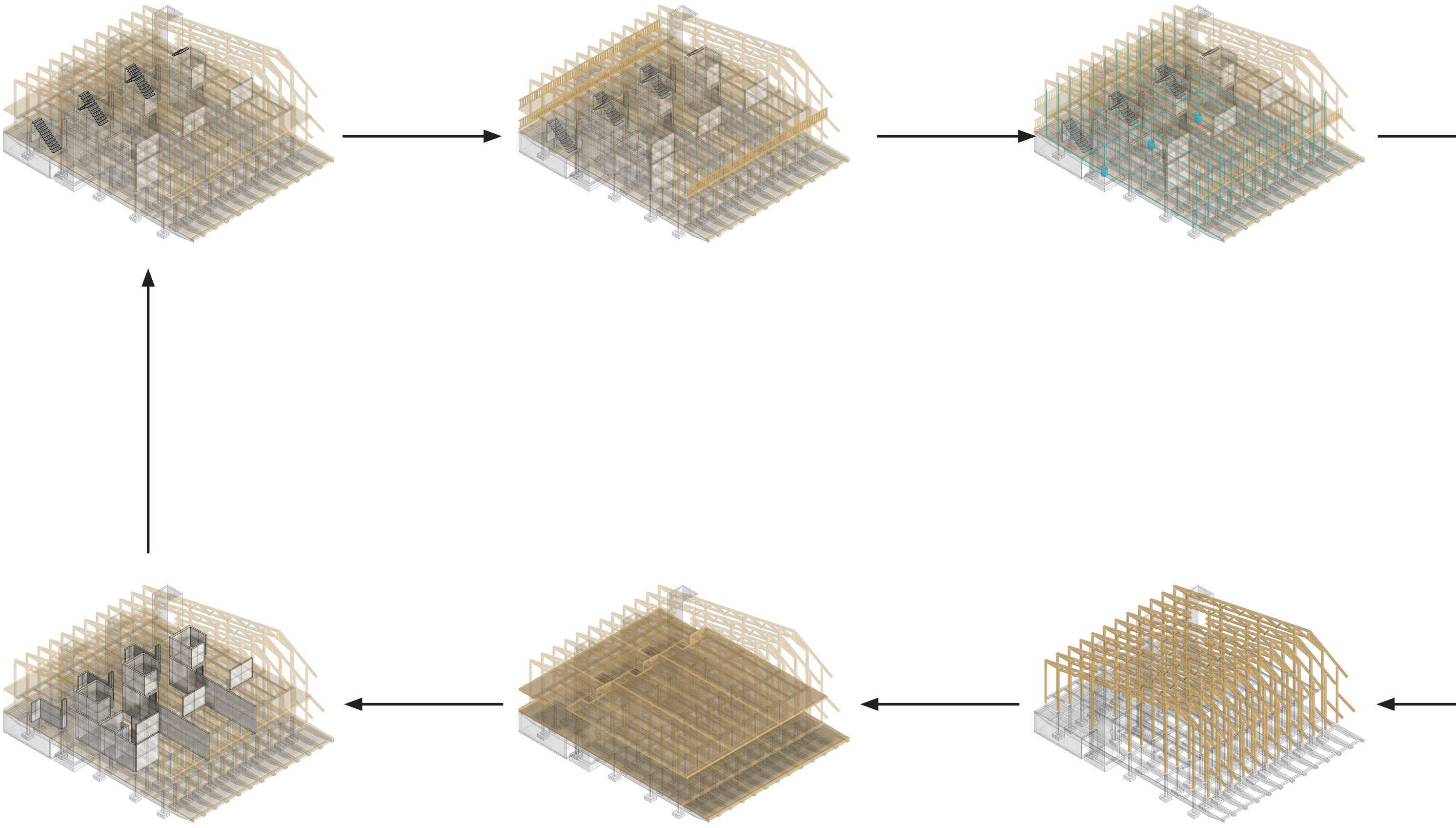


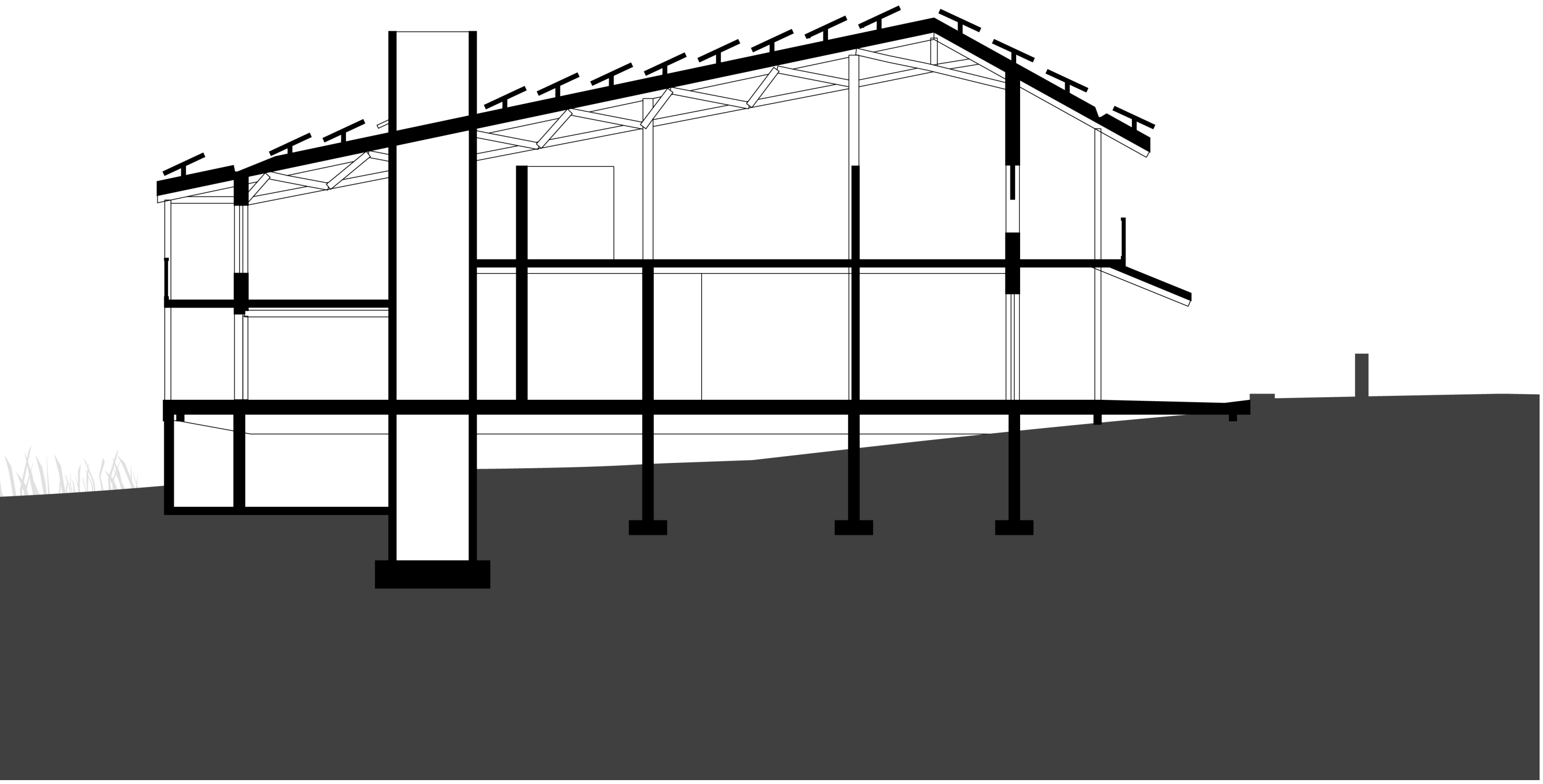
below: concept sketches showing the early thought process when developing housing prototype 2, located along the primary street of mayersville. the mixed-use typology of this prototype allows for commerce to intermingle with resident life, promoting a small business economy, while offering alternative living conditions besides the single-family home typical of suburban and small town america. raised streets and restored wetlands border these homes.

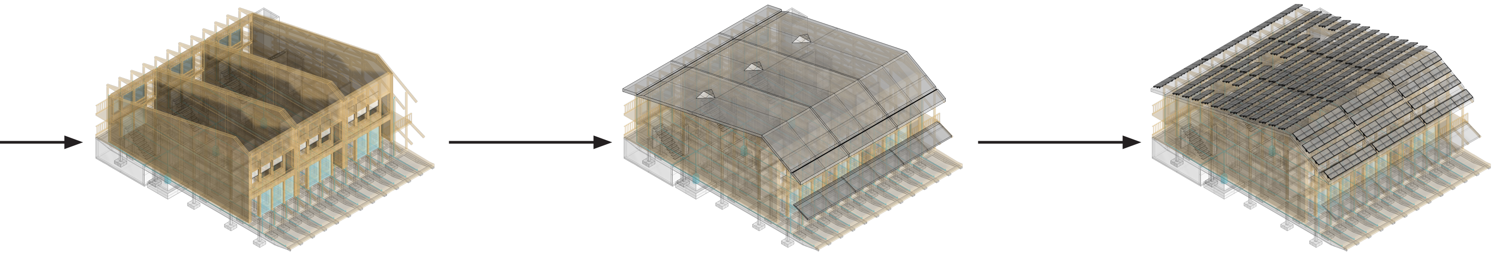
bottom (this page and next page): construction sequence of housing prototype 2. the sequence begins with the cores (1), before adding foundations (2), piers (3), trusses (4), floor slabs (5), interior walls (6), stairs (7), and railings (8). lastly, the water collection system (9); exterior walls, glazing, and shading devices (10); roof (11), and solar panels (12) are placed.

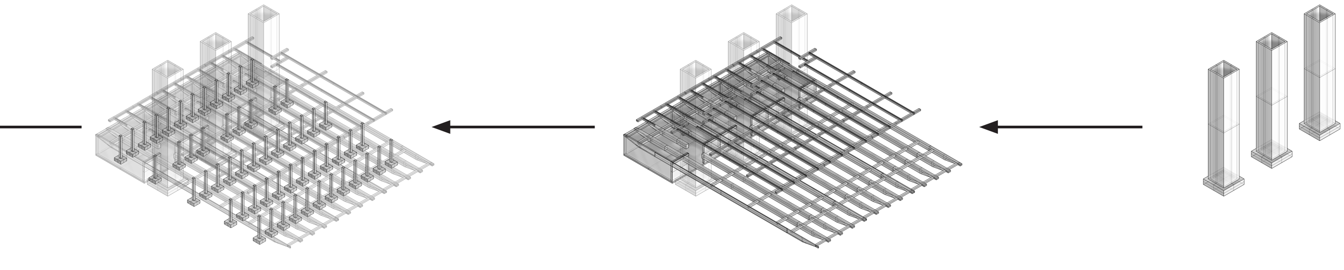
right, continuing onto next page: a section of housing prototype 2, originally drawn at 1 in = 8 ft, cut through the center of the core.





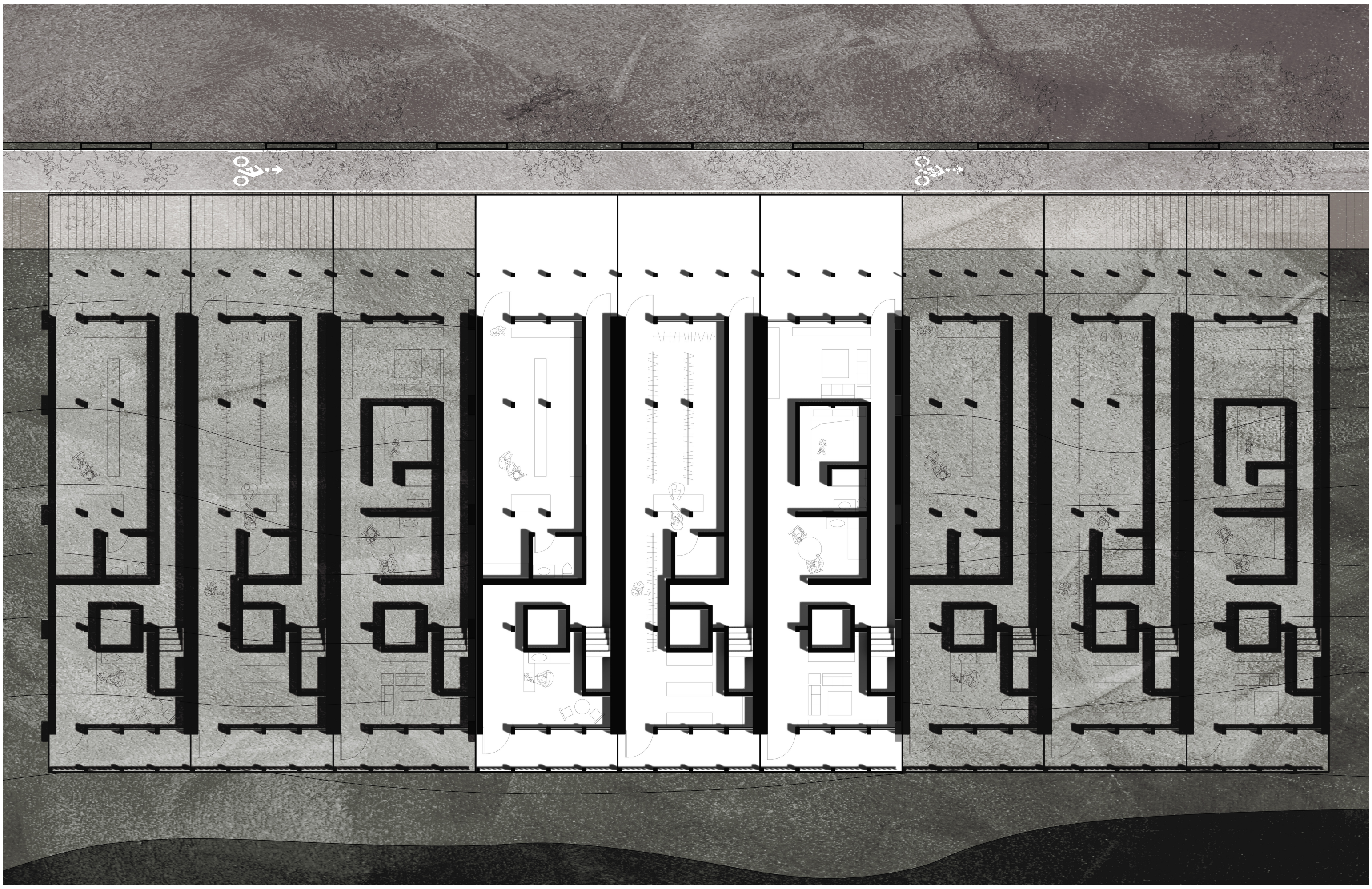


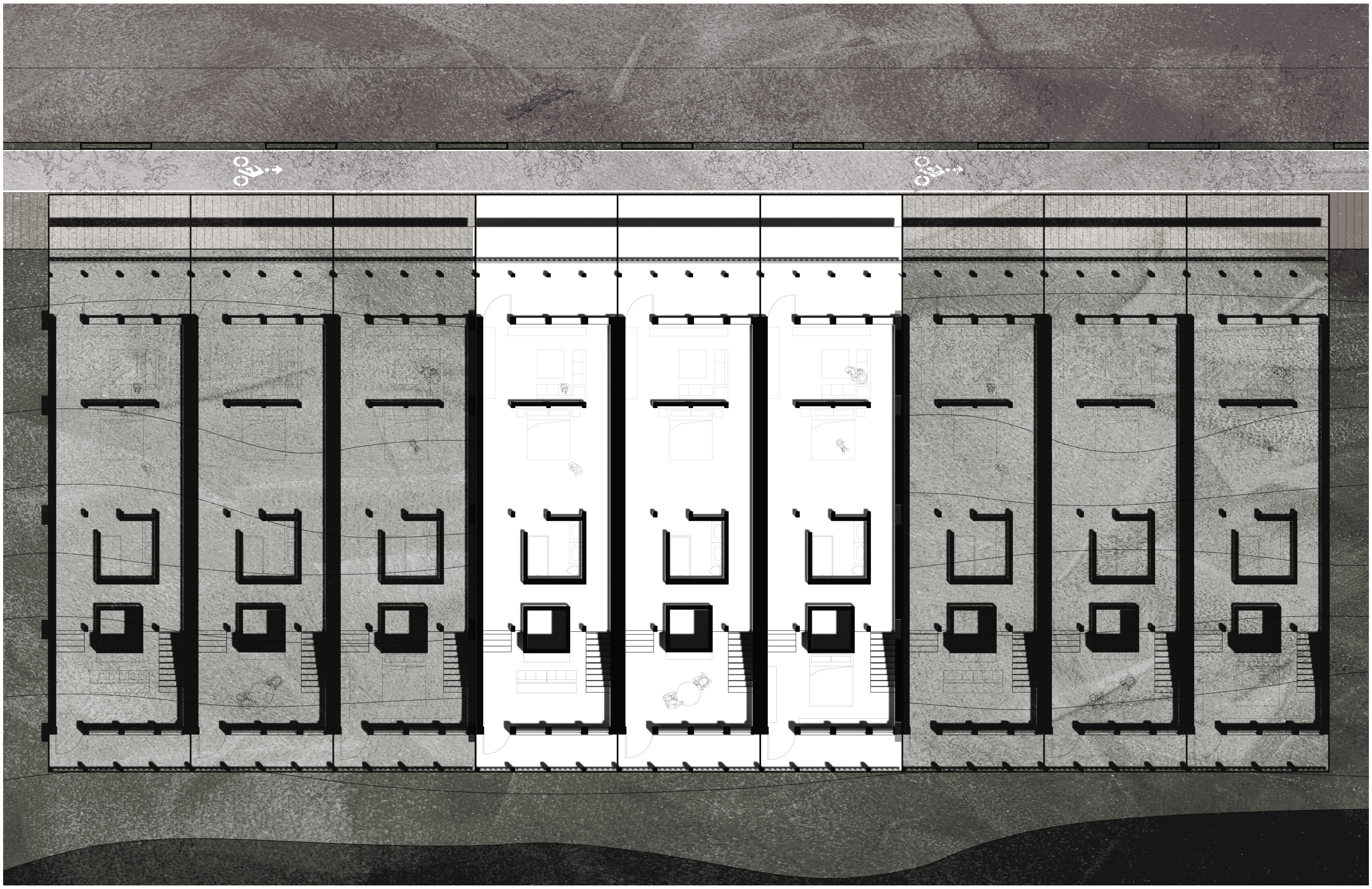


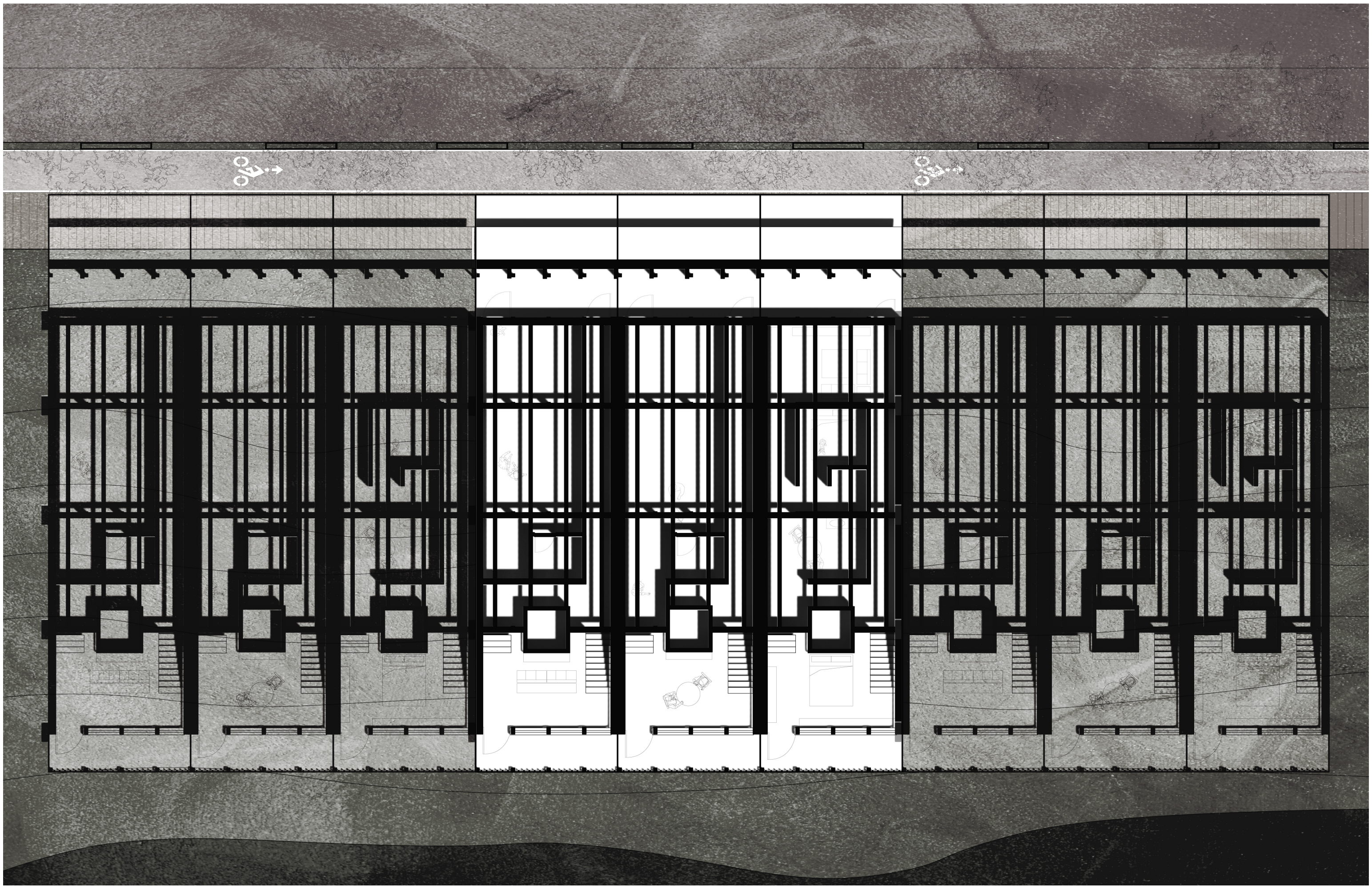


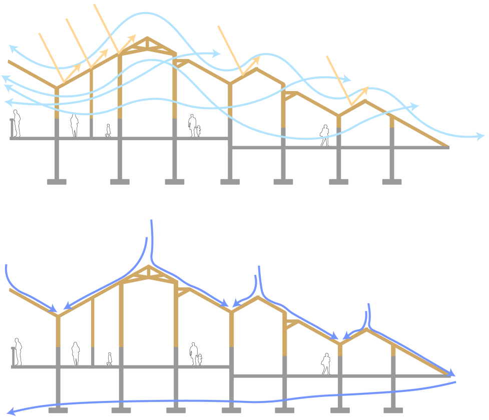
bottom, next page: floor plans for housing prototype 2, originally drawn at 1 in = 8 ft. the plan below depicts a lower level plan with a commercial program. the plans on the next page depict a residential loft program, showing the mezzanine (bottom) and upper (top) levels.

next spread: a perspective render looking out from the balcony of housing prototype 2. the combination of commercial and residential programs creates an engaging main street.



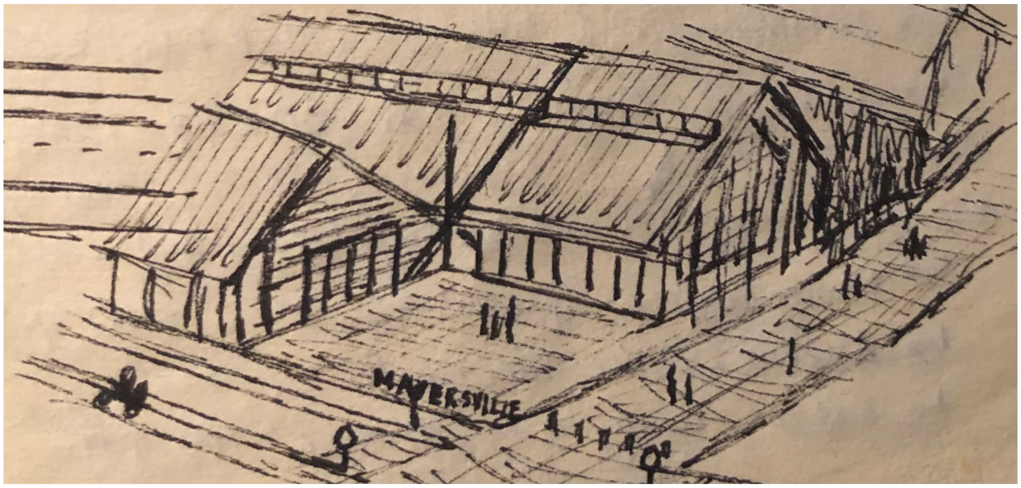


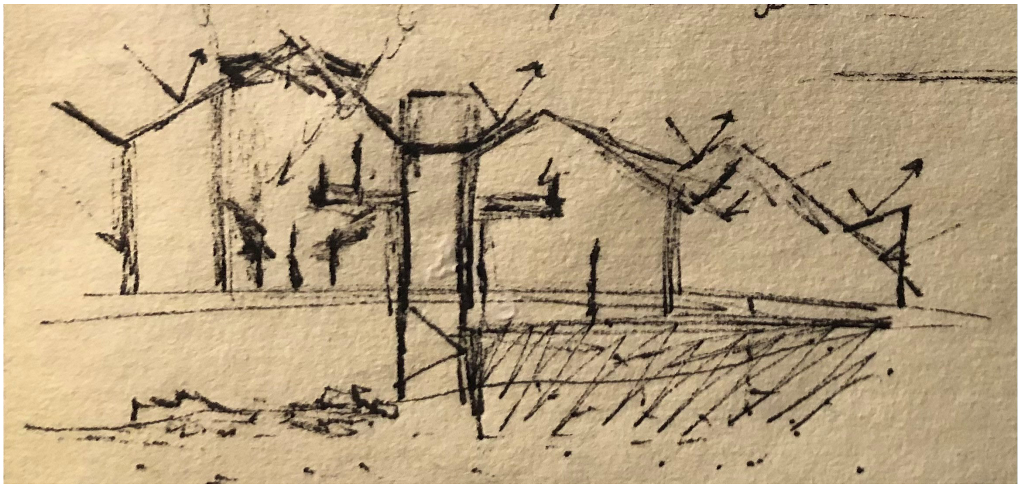




above: passive design strategies embedded in the design of the community center. the strategy functions similarly to those employed in housing prototypes, with cross ventilation shown on top and water movement shown on the bottom.

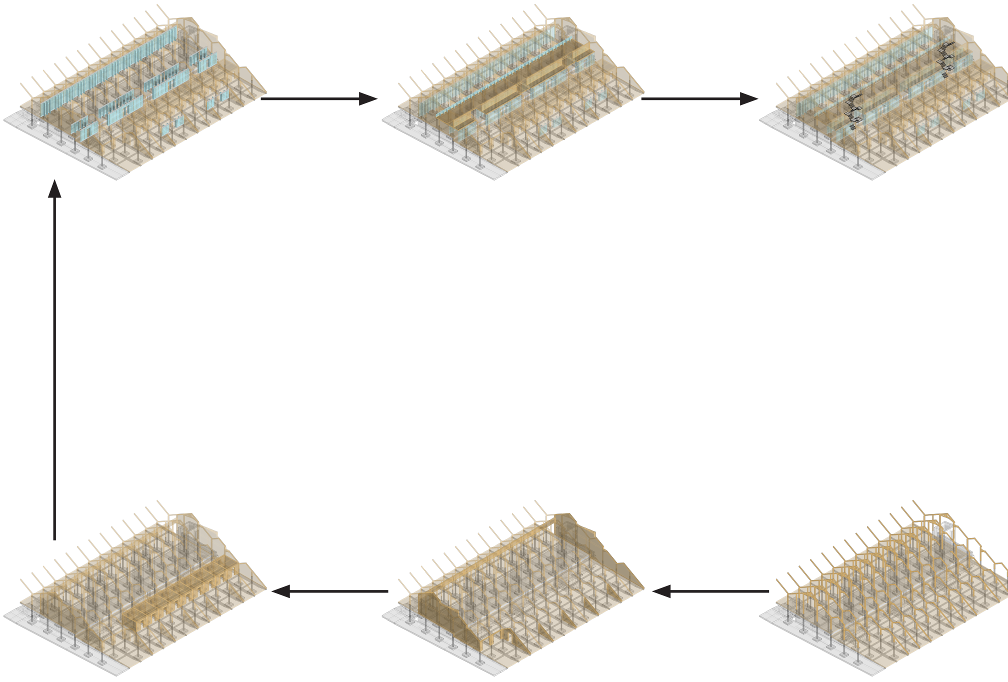
bottom, continuing onto next page: construction sequence of the community center. the sequence begins with the cores (1), before adding foundations (2), piers (3), lower level floors (4), trusses (5), exterior walls (6), interior walls (7), glazing (8), upper level floors (9), and stairs (10). lastly, the roof (11), balcony floor (12), balcony roof (13), and solar panels (14) are placed.



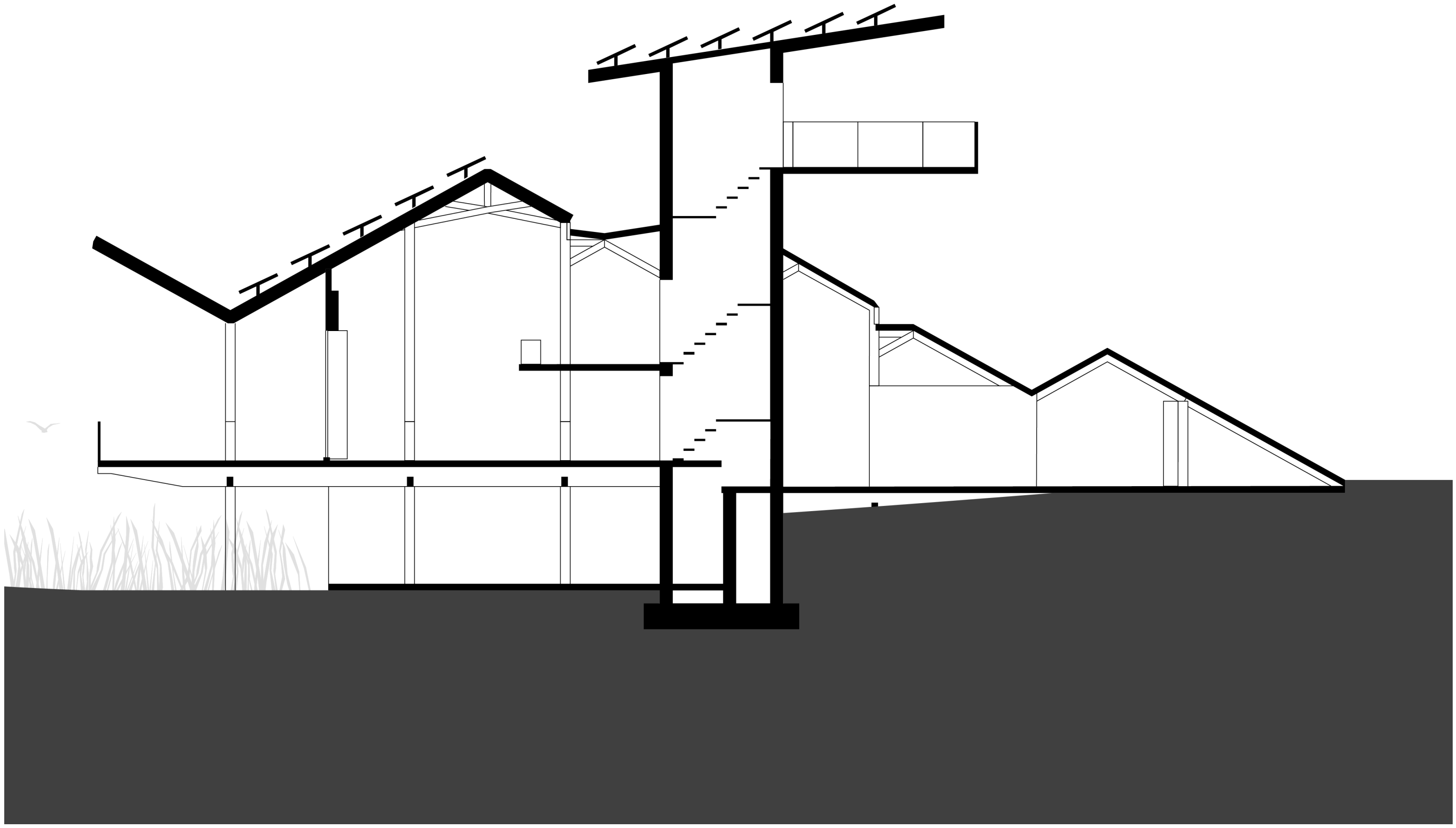


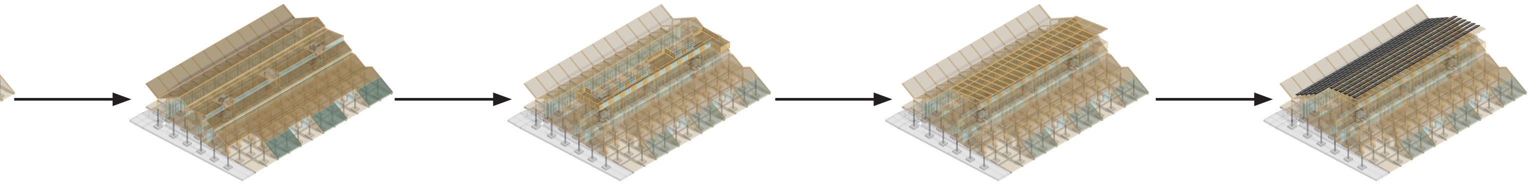
the center

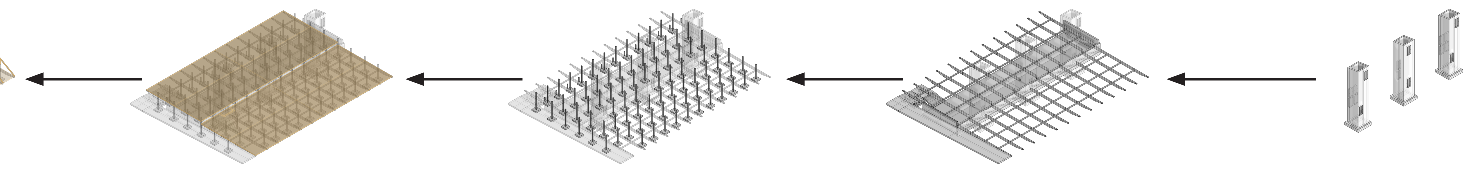
the community center is proposed at the southeast corner of the intersection of court street and cedar street. the site was selected due to its location along court street, a primary corridor of mayersville with proximity to key civic buildings. the community center utilizes the quadrants formed by the residence as building blocks. an undulating series of gables creates a sense of familiarity to nearby residences while underscoring the significance of the structure. positioned towards the front of the structure, along court Street, are a series of alternating greenhouse and streetscapes. this alternation allows for sunlight to reach greenhouses during the morning and evening hours, while providing spaces for informal gathering or transportation infrastructure (such as bike racks or a bus stop). behind the greenhouses are a collection of meeting rooms, offices, and classrooms. these spaces provide room for community organizations, after school programs, daycare activities, and other community-focused programs. a slight change in the floor slab signals a transition to a larger multi-purpose space, forming a hub to host farmer's markets, art fairs, and a variety of other large-scale community activities. the multi-purpose space has direct access to a covered boardwalk at the rear of the structure, providing views of the wetlands behind and interweaving the rear of the building into a pedestrian corridor used by residents and visitors alike.



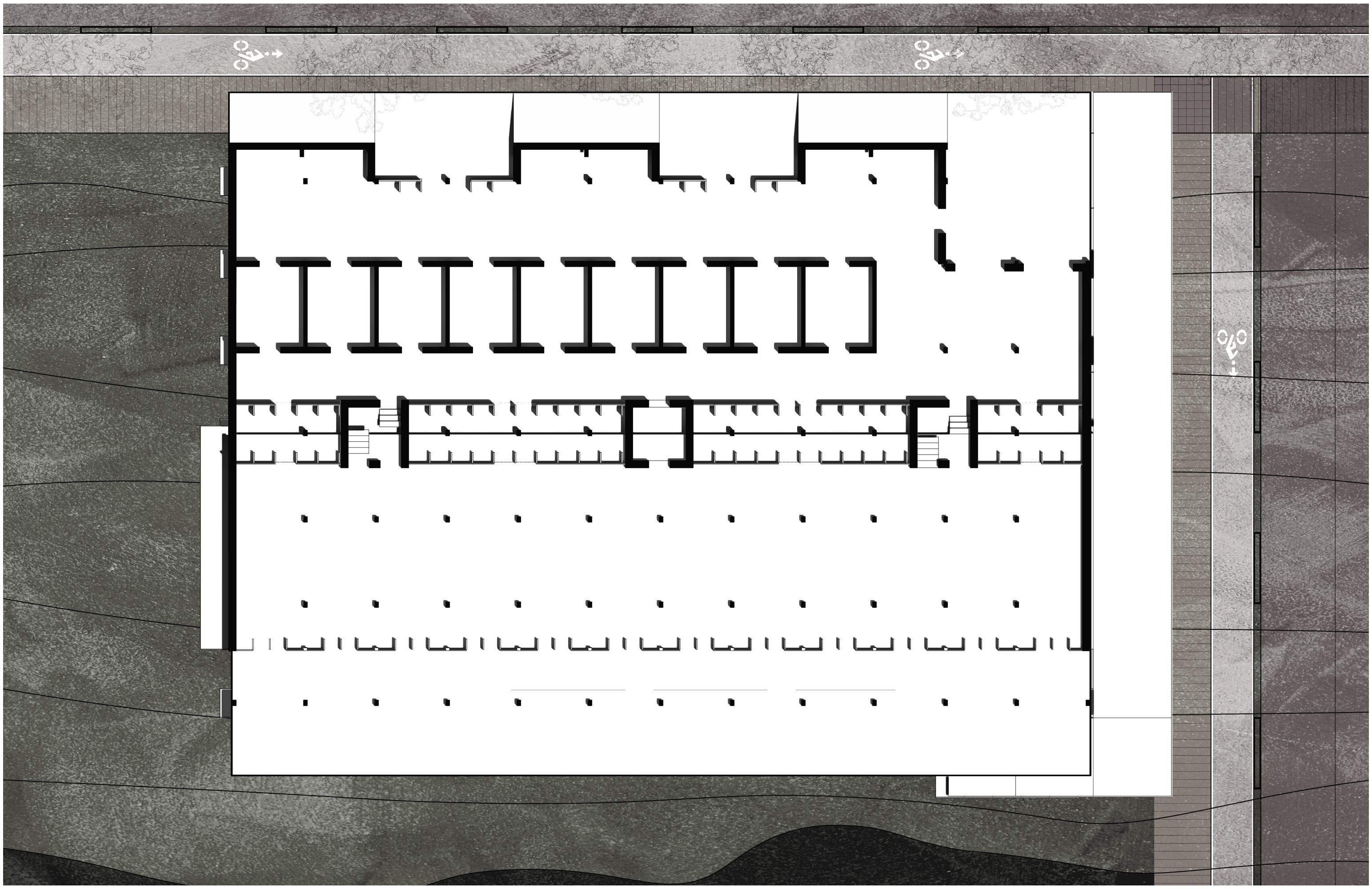
below: a section of the community center, originally drawn at 1 in = 8 ft, cut through the center of the core

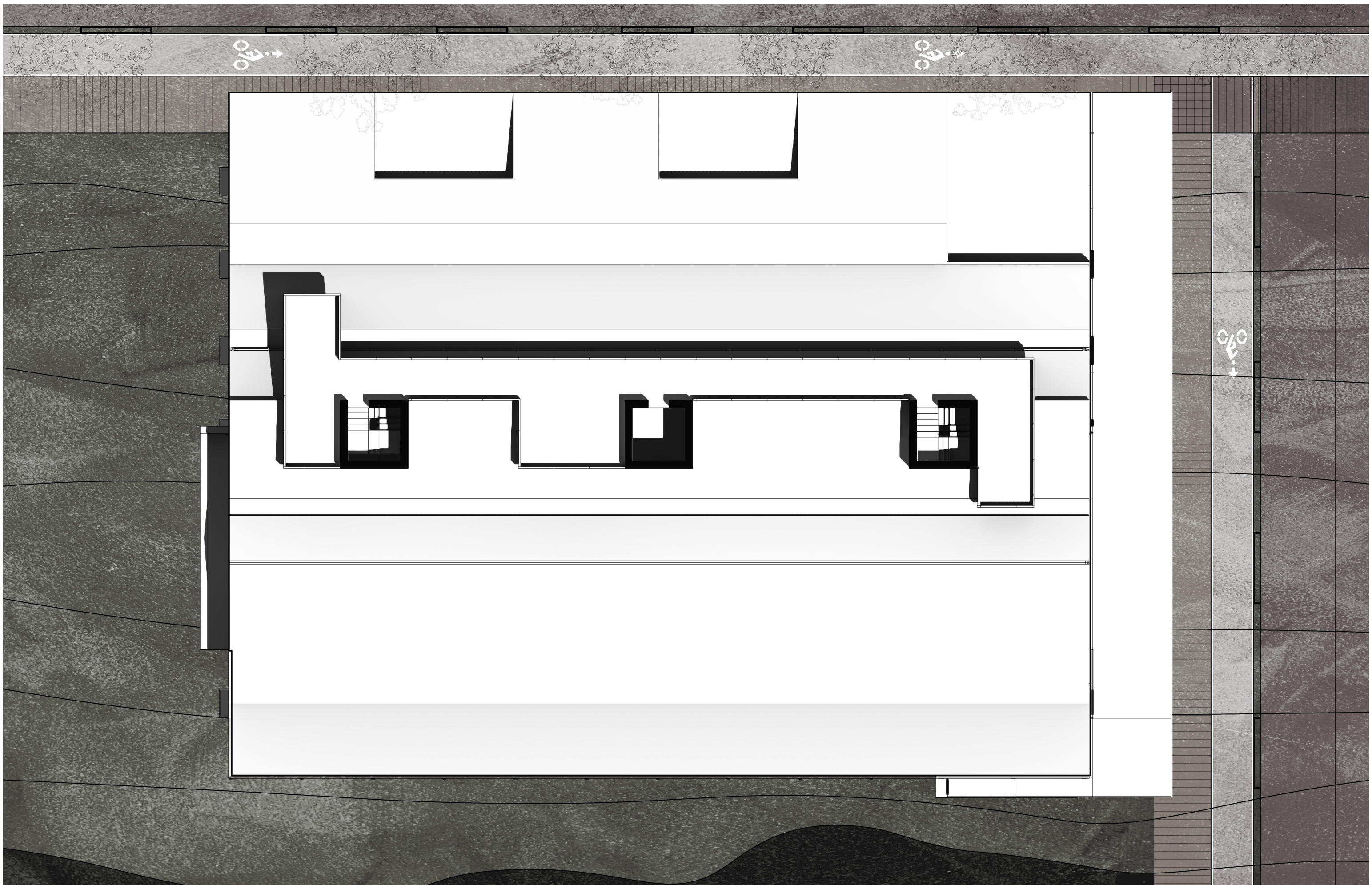


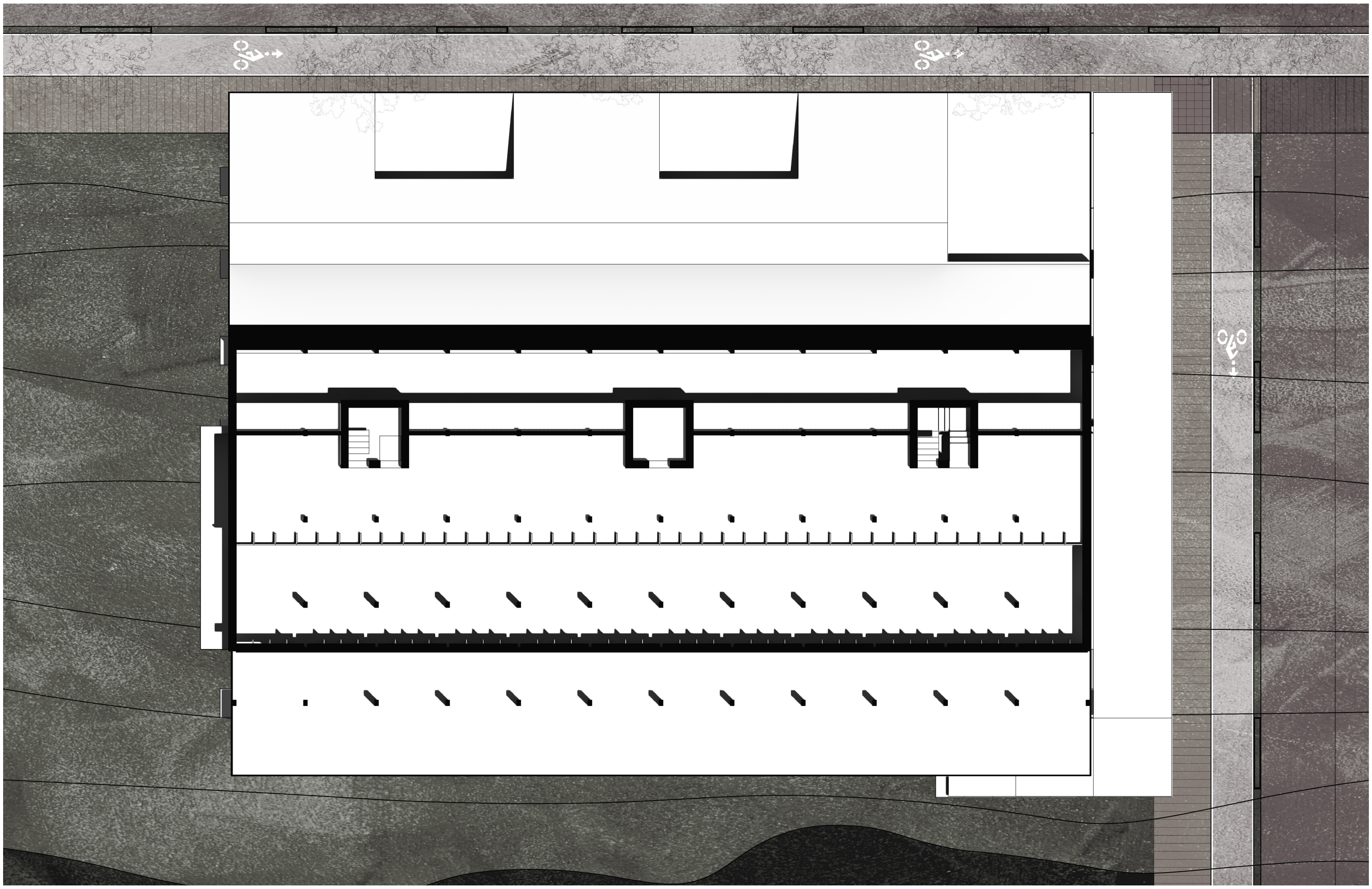




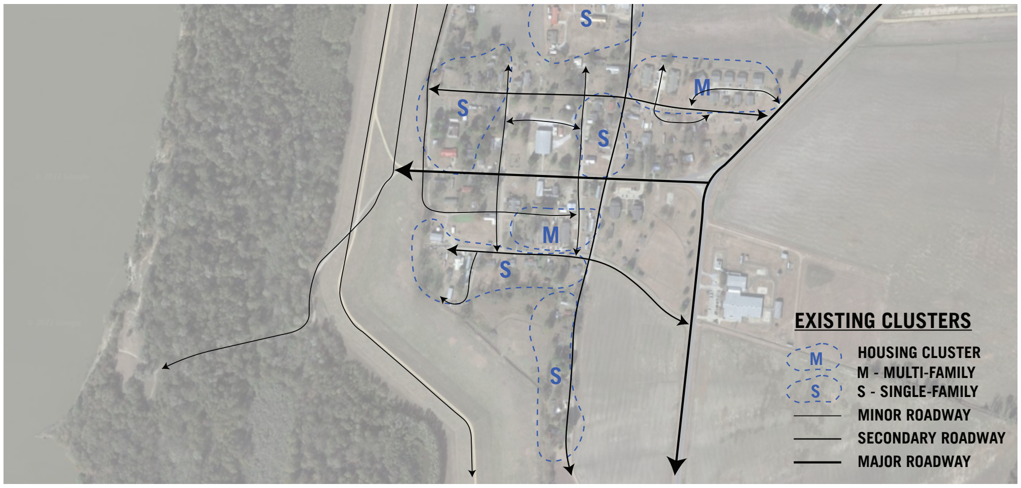
bottom, next page: floor plans for the community building, originally drawn at 1 in = 8 ft. the plan below depicts the lower level plan. the plans on the next page show the upper level (bottom) and balcony level (top).





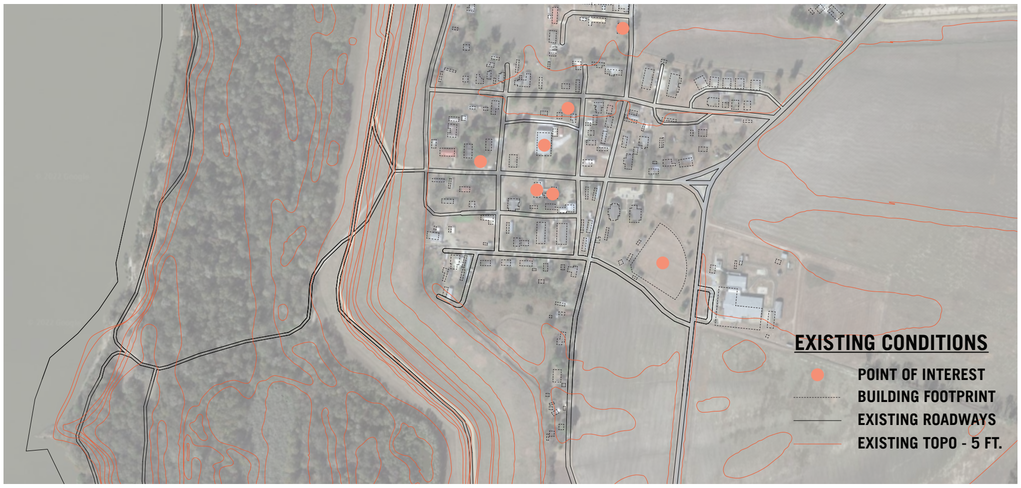


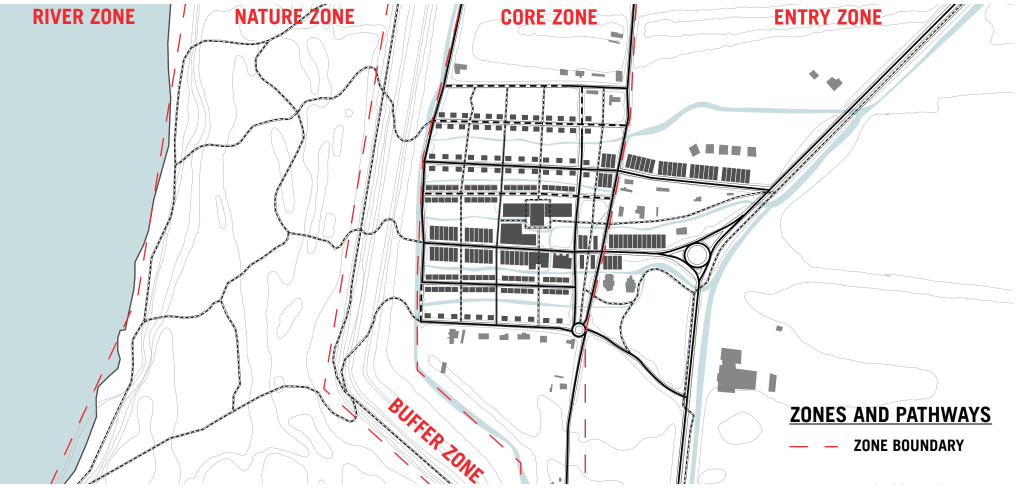
right: diagrams of the existing conditions found within the town of mayersville. the first diagram (top) depicts existing residential clusters and roadways. residential clusters are organized into single-family or multi-family clusters. roadways are organized into minor, secondary, or major roadways. the second diagram (middle) depicts points of interest, topographic contour lines, building footprints, and roadway outlines. the last diagram (bottom) shows an early rendition of the final site plan, along with the town's organizing zones: the river zone along the mississippi, the nature zone consisting of the river's floodplain, the buffer zone containing the levee, the core zone made up of the town grid, and the entry zone featuring major roadways connecting the town to nearby communities.

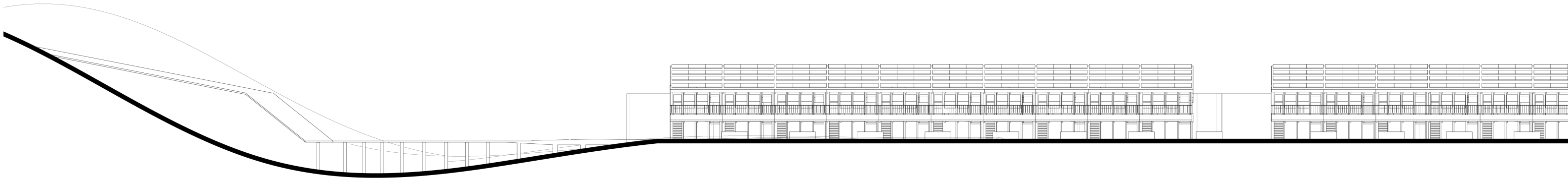


the town

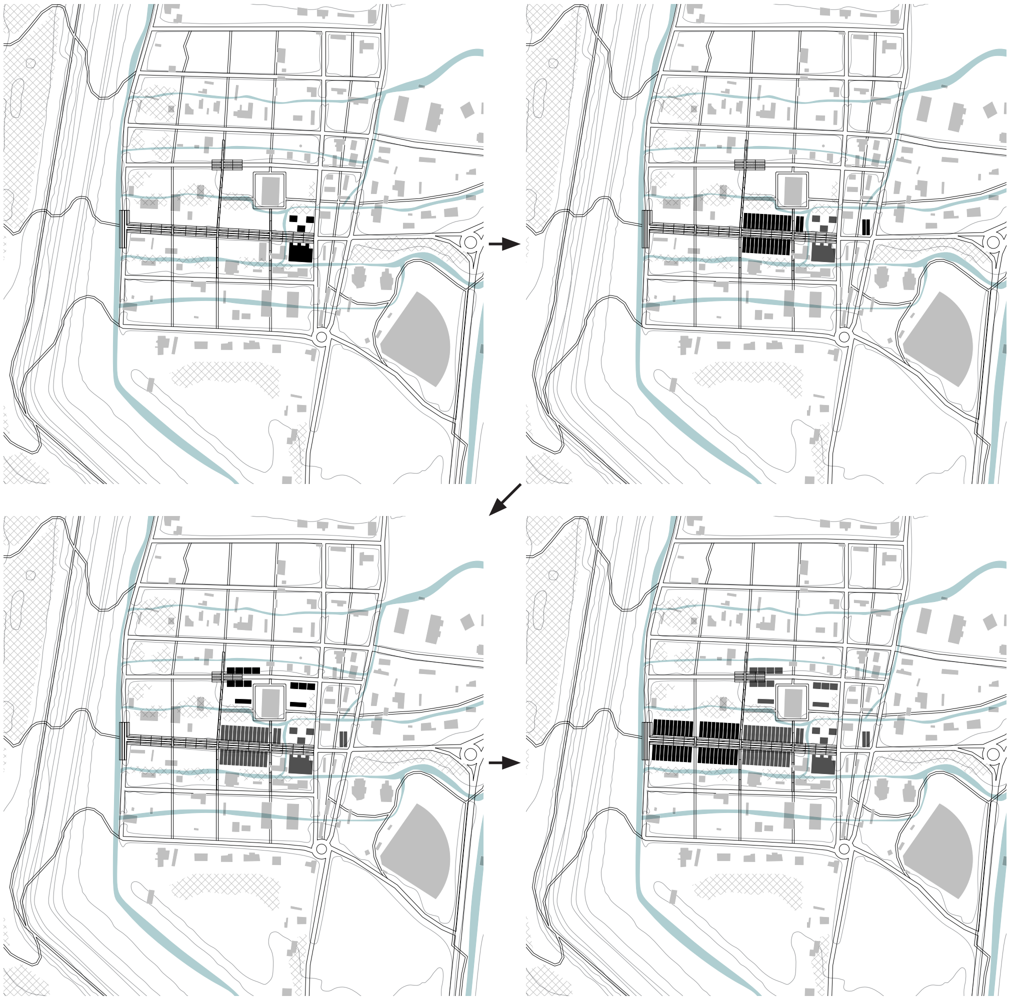
a series of interventions proposed for the town of mayersville creates a renewed sense of place and seeks to attract a wide range of both new residents and visitors. the first intervention seeks to transform court street into main street through the formation of a civic center in the heart of mayersville. a civic plaza occupies the current site of the issaquena county courthouse, with a cluster of civic buildings on and around the site to coalesce community. court street is bounded by a mixed-use district featuring small businesses, education centers, and missing middle housing. the second intervention aims to create environmental corridors and provide spaces for tourism and recreation, throughout mayersville, roadways are raised while trenches are dug for a system of reclaimed wetlands. these canal-like wetlands concentrate water while allowing for residents to escape the mud-like conditions of seepage flooding. along ms-1, a proposed walk-bike trail (dubbed the mississippi greenway) would draw hikers, bicyclists, and tourists to journey along the mississippi's scenic rural communities (integrating pedestrian access with the nearby town of rolling fork). another vision sees the expansion of grey russell park into a center of recreation with natural amenities. the west side of town, featuring the levee and the shores of the mississippi river, provides an excellent location for a nature park and high line-style "levee walk". the boardwalk nature park and levee walk provide a rich system of trails for both residents and guests to connect with and admire the beauty of the mississippi river. a ferry connection could even be located at the southern end of the park, in a protected cove away from the rapidly moving waters of the river. the nature park, levee walk, and ferry connection allows mayersville residents to be more physically connected to the river and provides easier access to regional centers of vicksburg and greenville. zones for expansion are identified as well in order to provide a strategic plan for retrofitting and reusing the existing land in mayersville.







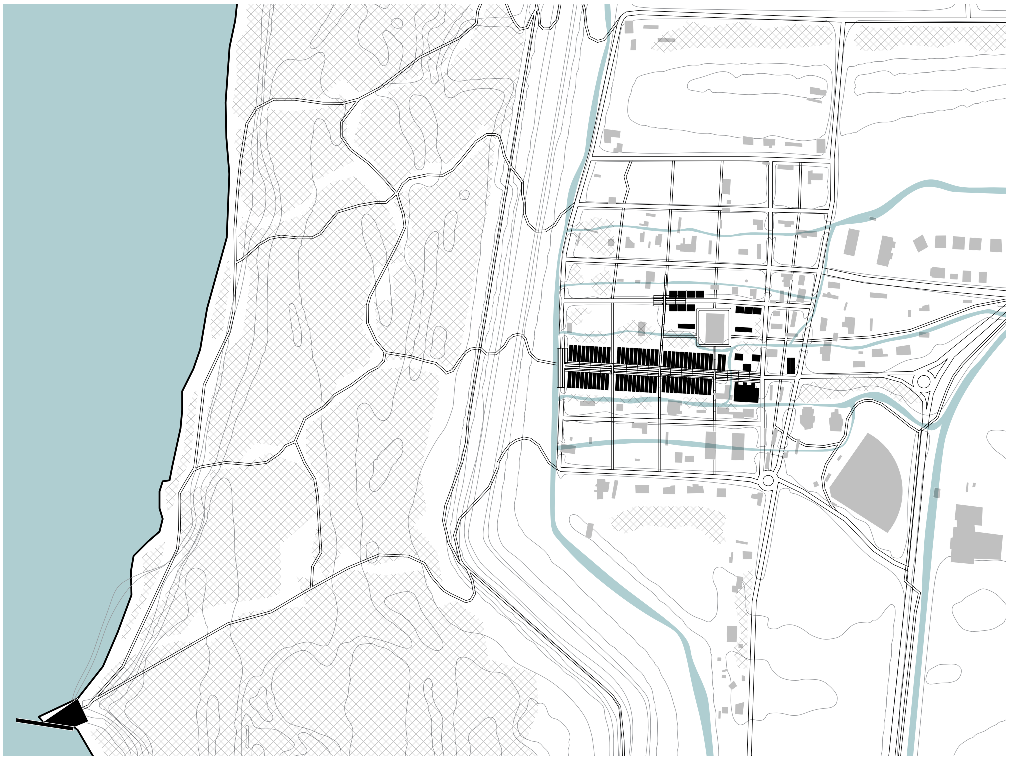
right: mappings demonstrating the phased rollout of the mayersville community plan. phase 1 (top left) features the construction of the community center and housing prototype 1s along civic street. additionally, roads are raised, streets are pedestrianized, a wetland network is built, and roundabouts are installed at key nodes. phase 2 (top right) features the construction of housing prototypes 2s along civic street at the center of town. this establishes a mixed-use court street while increasing foot traffic, promoting small businesses, and adding in functionality for multi-generational residences. phase 3 (bottom left) features attached housing units and administrative offices around and to the north of the courthouse. this provides townhouse-style "missing middle" units and seeks to amplify the civic core. phase 4 (bottom right) features housing prototype 2 units along the rest of civic street and the establishment of a nature park to the west of town. this nature park would feature a levee walk, a network of raised boardwalks, and a ferry terminal along the river.

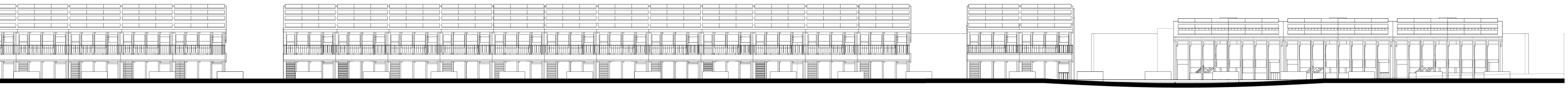


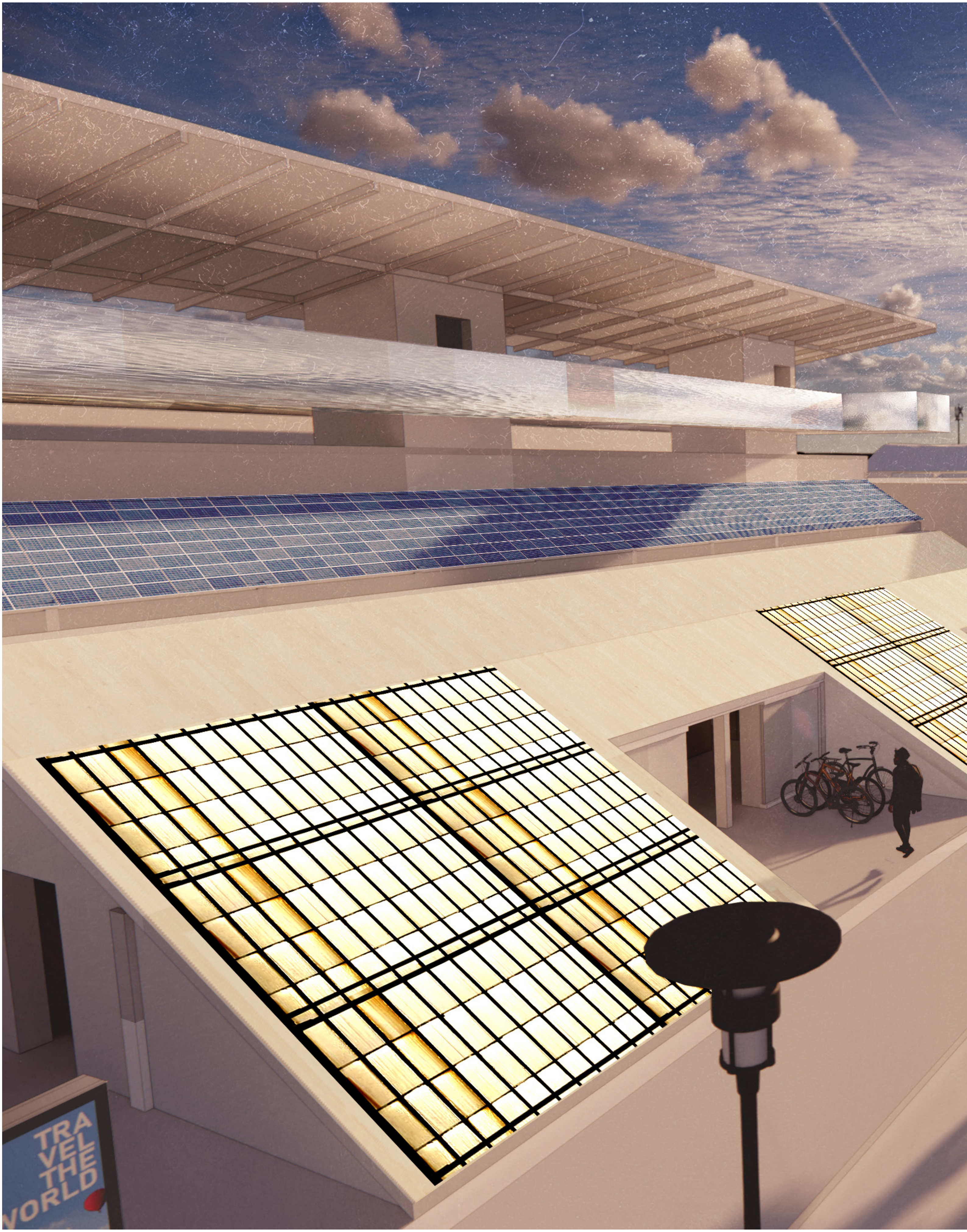
right: the overall mayersville community plan, originally drawn at a scale of 1 in = 200 ft.

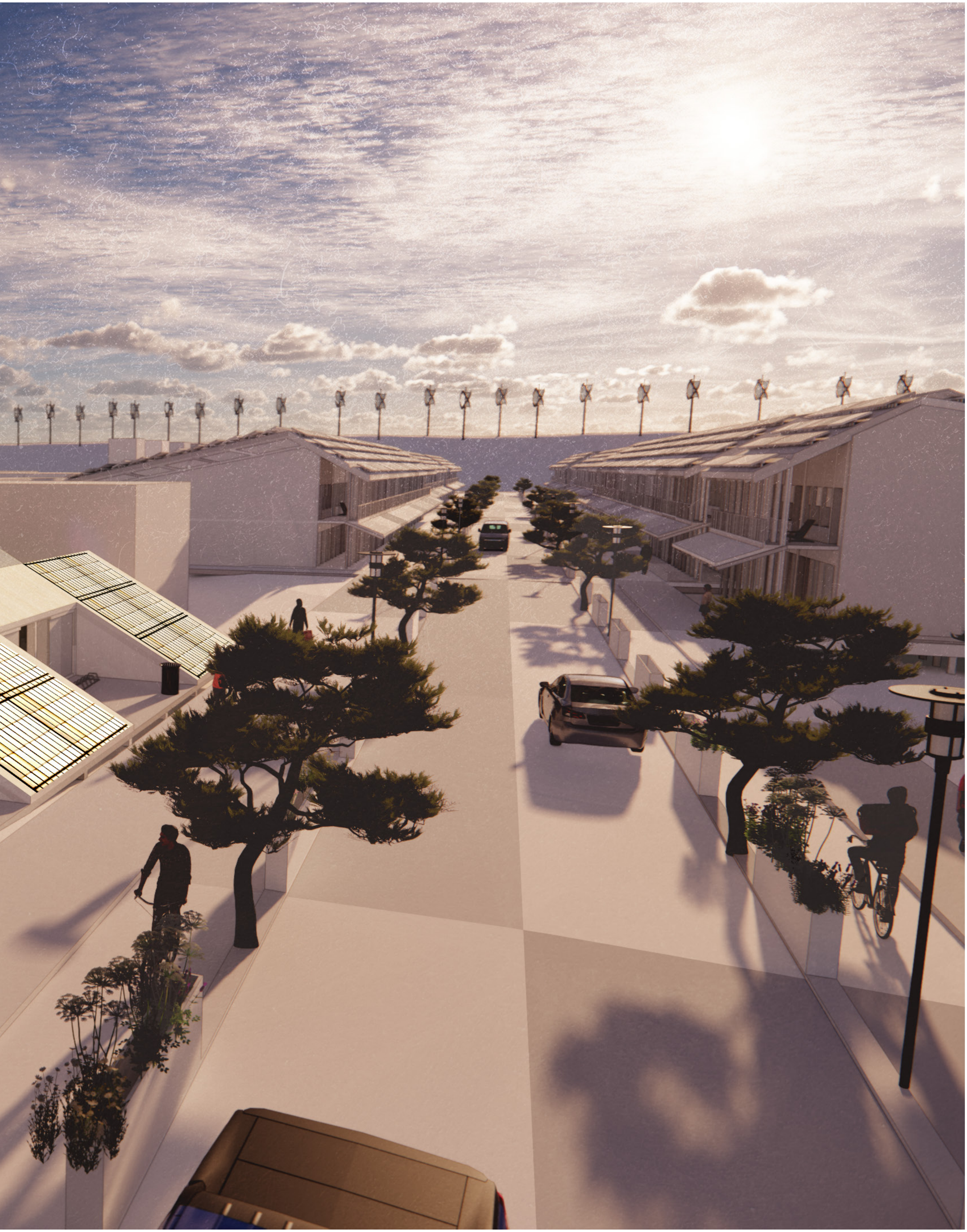
bottom, continuing onto opposite page: a site section of mayersville, looking north. originally drawn at a scale of 1 in = 25 ft.

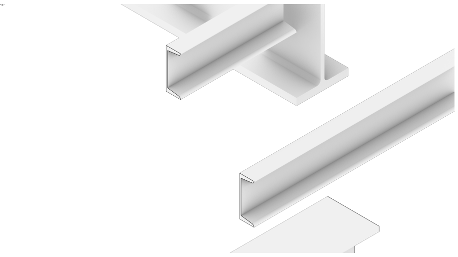
next spread: perspective render of court street in front of the mayersville community center, looking west towards the levee. this future imagines a mixed-use court street with increased pedestrianization and alternate modes of transport, such as biking. wind turbines in the future, strategically placed on the levee, could provide an additional source of power to mayersville's residents.



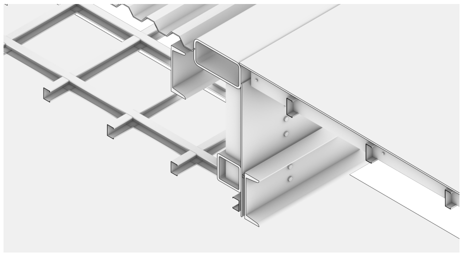



TRAVEL THE WORLD

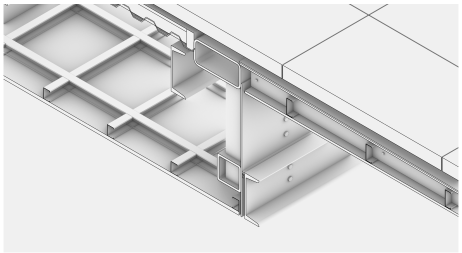




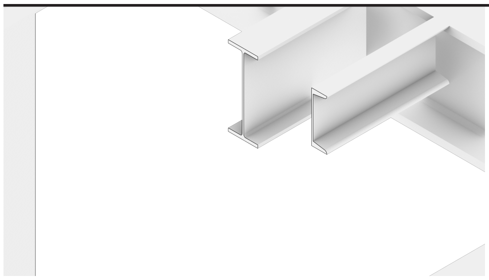
① Nosing Structure
NTS



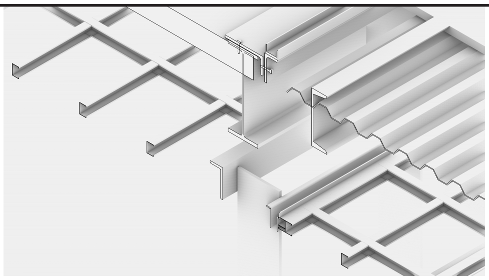
② Nosing Substructure
NTS



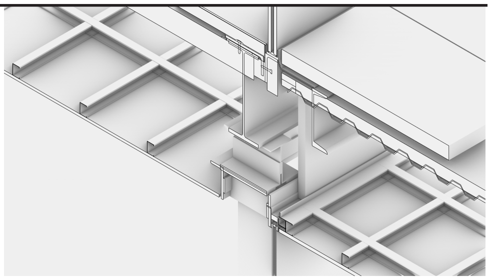
③ Nosing Detailing
NTS



① Glazing Head Structure
NTS



② Glazing Head Substructure
NTS

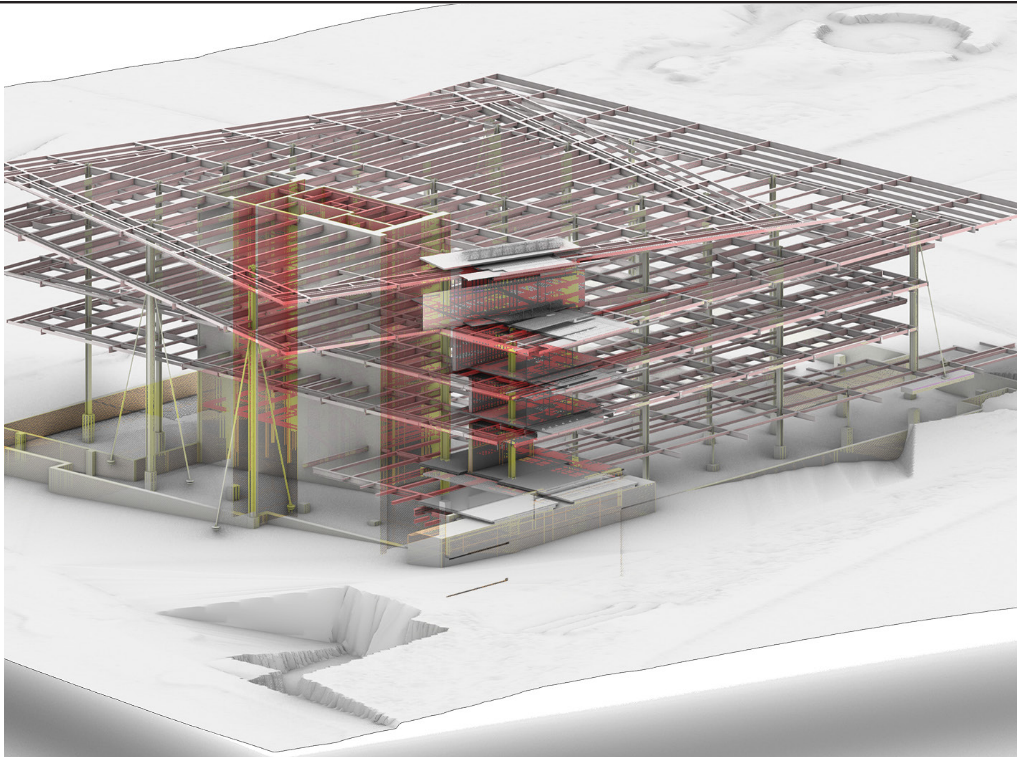


③ Glazing Head Detailing
NTS

above: assembly sequences of glazing head and cantilevered nosing systems

right: a layered isometric view of the building, highlighting the different structural systems

next page and spread: select final sheets showing assembly sequences and keyed detail drawings



des moines, ia

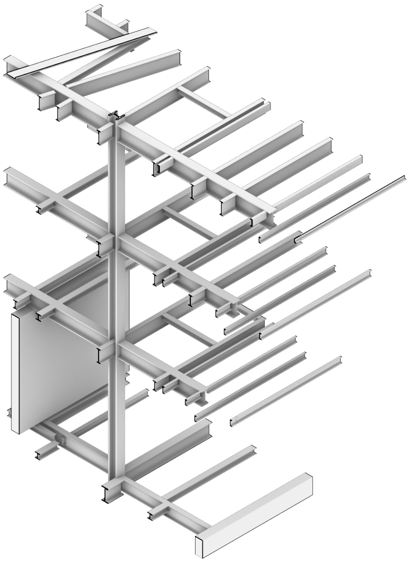
this project sought to understand how building components integrate with each other by recreating a building in 3d form from its respective drawing set. tasked with deriving renzo piano building workshop's krause gateway center, our team began by jointly building out the site and structure. each team member subsequently took a corner of the building to fully detail. final deliverables specified keyed drawings, 3d details, and assembly sequences.

modeling of project site, structure, and case study assessment done in collaboration with colin finnigan, kishore kandasamy, and sneha moorthy.

recreating krause

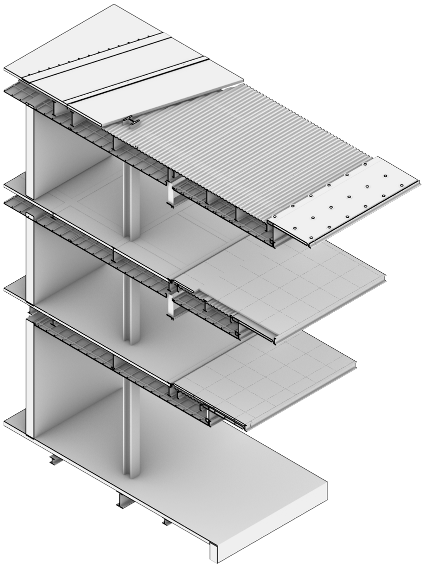
interpreting construction documents

arch7102: integrated building systems 2
professors jim case, lena klein, scott marble, charles rudolph
spring 2022



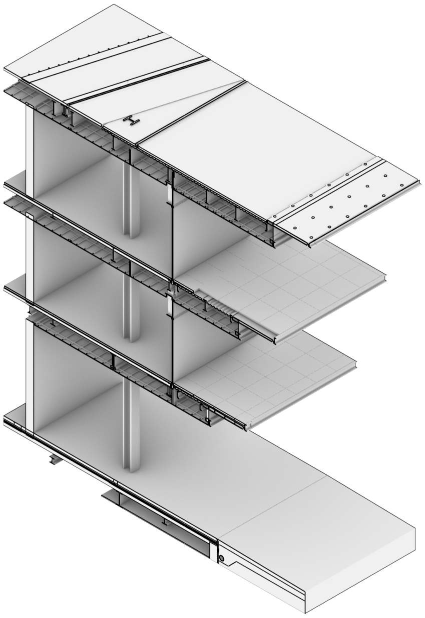
1 L2, L3, L4 Structure

NTS



2 L2, L3, L4 Substructure

NTS



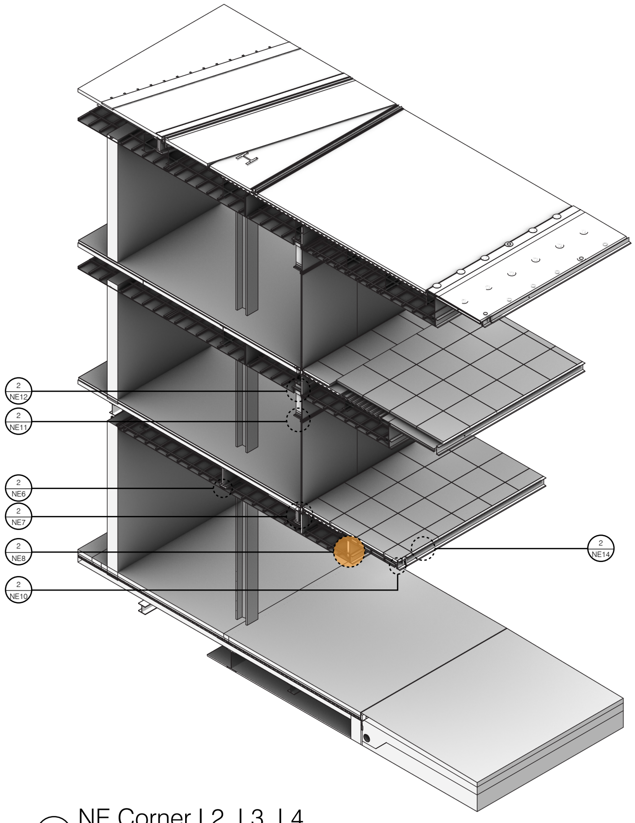
3 L2, L3, L4 Detailing

NTS

NE5 L2, L3, L4 Construction

Daniel Castro
ARCH7102 - Integrated Building Systems II
Spring 2022

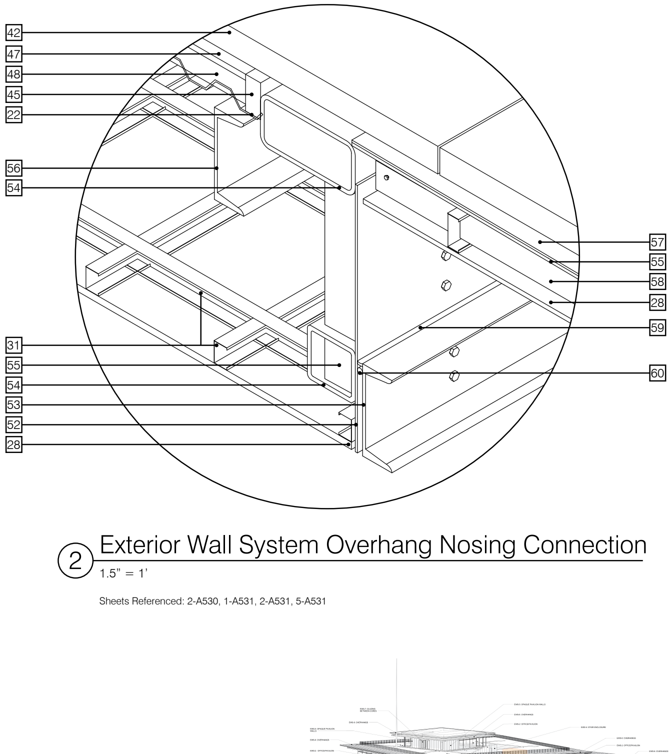
Krause Gateway Center
1459 Grand Avenue, Des Moines, Iowa 50309
Renzo Piano Building Workshop with OPN Architects


2 NE12
2 NE11
2 NE6
2 NE7
2 NE8
2 NE10
2 NE14

1 NE Corner L2, L3, L4

1/8" = 1'

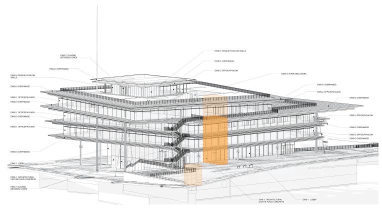
Sheets Referenced: 1-A340


42
47
48
45
22
56
54
31
55
54
53
52
28
57
55
58
28
59
60

2 Exterior Wall System Overhang Nosing Connection

1.5" = 1'

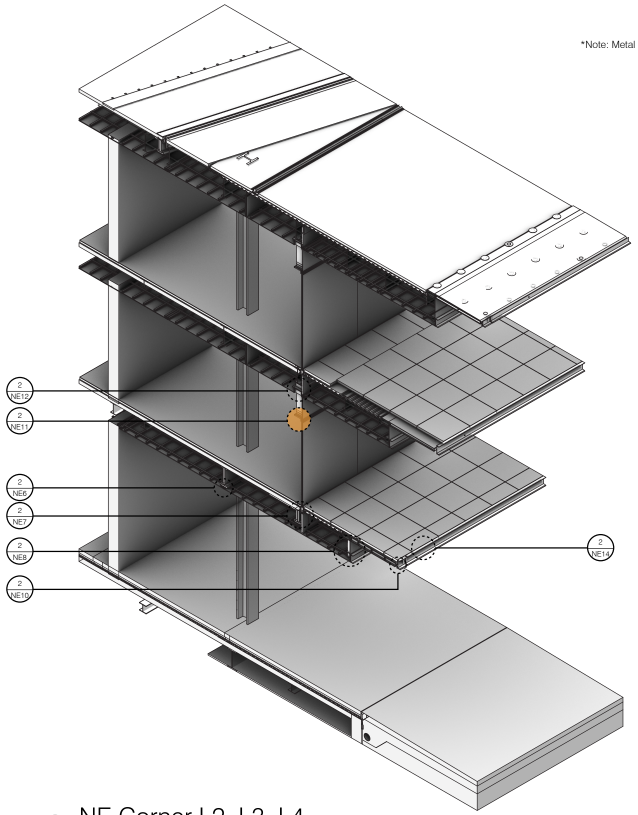
Sheets Referenced: 2-A530, 1-A531, 2-A531, 5-A531



NE8 L2, L3, L4

Daniel Castro
ARCH7102 - Integrated Building Systems II
Spring 2022

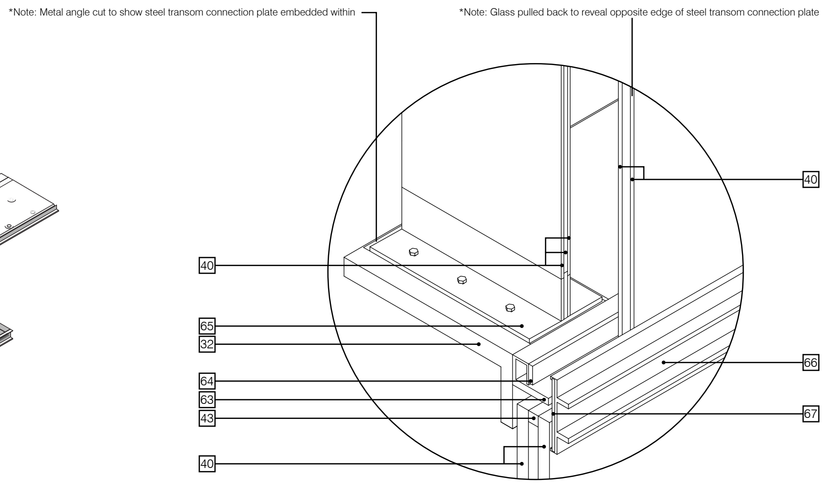
Krause Gateway Center
1459 Grand Avenue, Des Moines, Iowa 50309
Renzo Piano Building Workshop with OPN Architects


2 NE12
2 NE11
2 NE6
2 NE7
2 NE8
2 NE10
2 NE14

1 NE Corner L2, L3, L4

1/8" = 1'

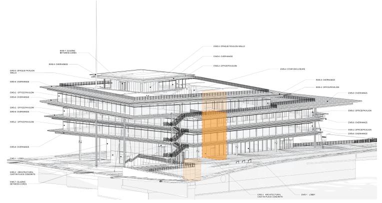
Sheets Referenced: 1-A340


*Note: Metal angle cut to show steel transom connection plate embedded within
*Note: Glass pulled back to reveal opposite edge of steel transom connection plate
40
40
65
32
64
63
43
40
66
67

2 Exterior Wall System Glazing Steel Transom

3" = 1'

Sheets Referenced: 3-A502, 7-A517, 4-A502, 5-A523, 6-A523

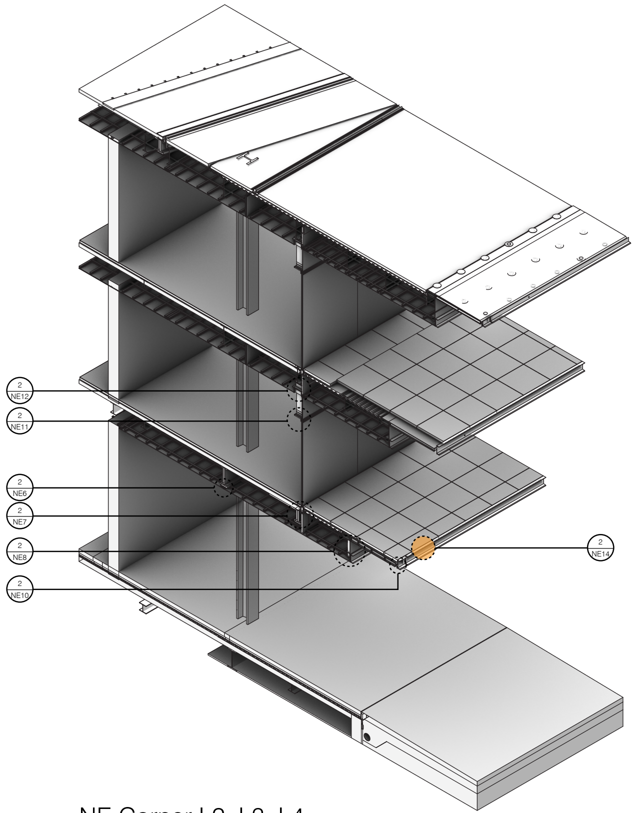


NE11 L2, L3, L4

Daniel Castro
ARCH7102 - Integrated Building Systems II
Spring 2022

Krause Gateway Center
1459 Grand Avenue, Des Moines, Iowa 50309
Renzo Piano Building Workshop with OPN Architects

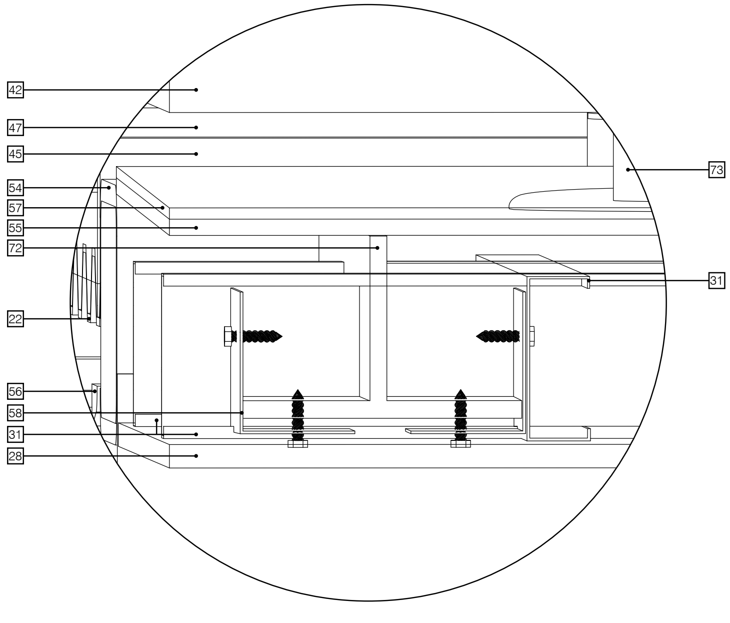
KRAUSE
GATEWAY
CENTER


2 NE12
2 NE11
2 NE6
2 NE7
2 NE8
2 NE10
2 NE14

1 NE Corner L2, L3, L4

1/8" = 1'

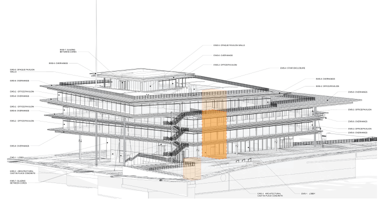
Sheets Referenced: 1-A340


42
47
45
54
57
55
72
22
56
58
31
28
73
31

2 Exterior Wall System Typical Upper Soffit Framing

6" = 1'

Sheets Referenced: 2-A531



NE14 L2, L3, L4

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Spring 2022

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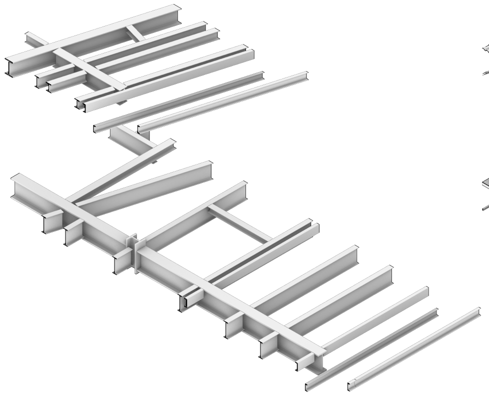
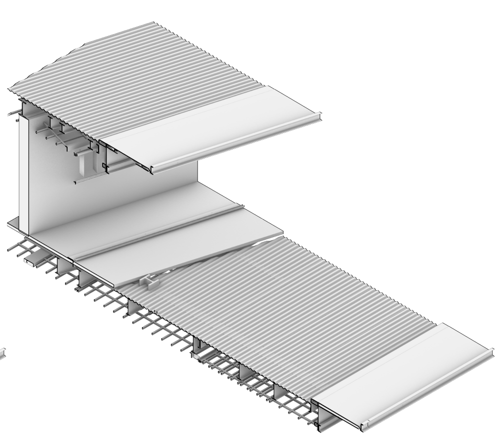
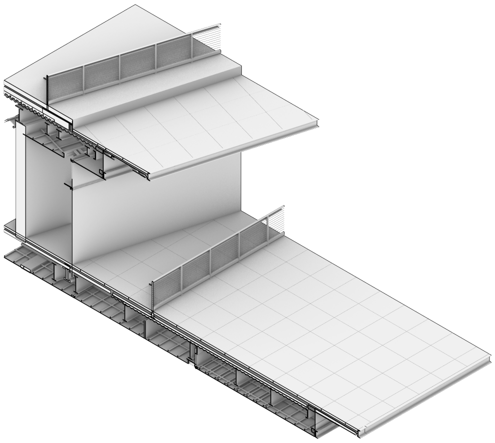
KRAUSE
GATEWAY
CENTER



1 L5, L6 Structure
NTS



2 L5, L6 Substructure
NTS



3 L5, L6 Detailing
NTS

NE15 L5, L6 Construction

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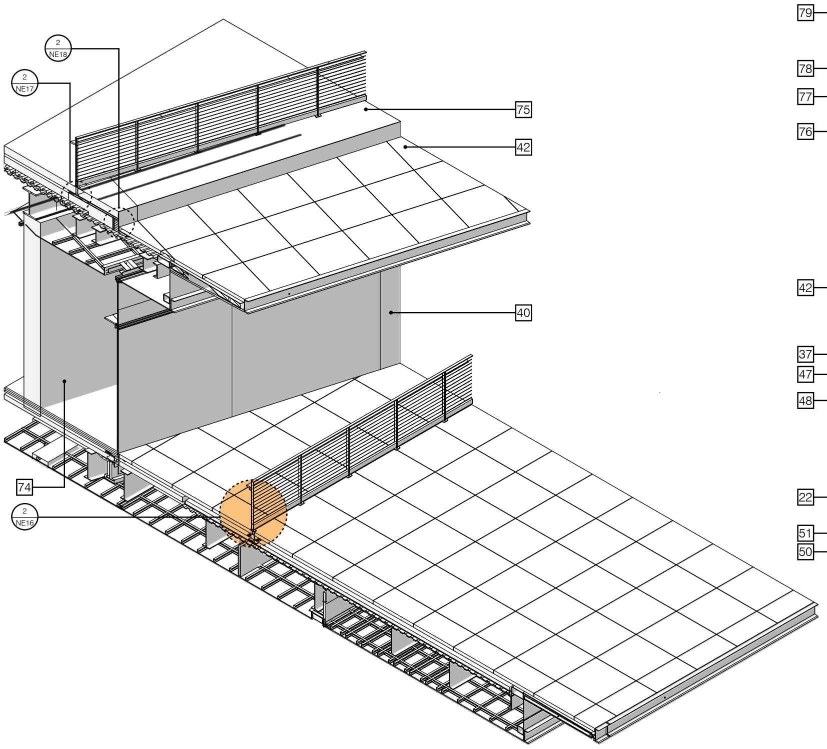
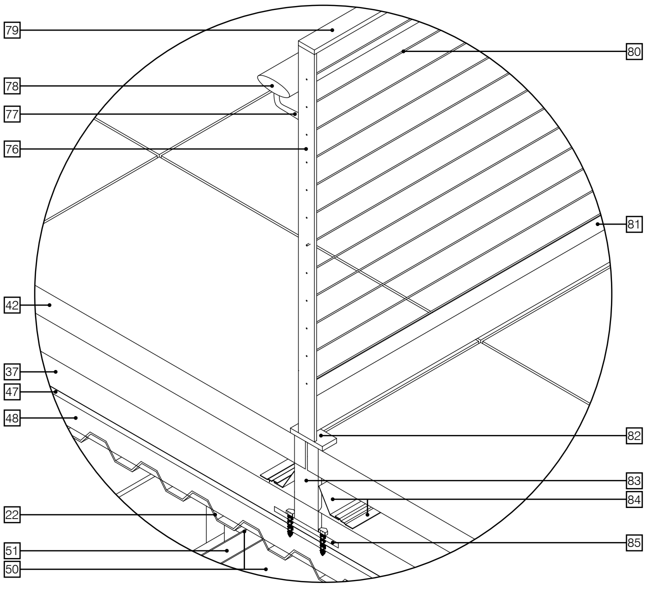


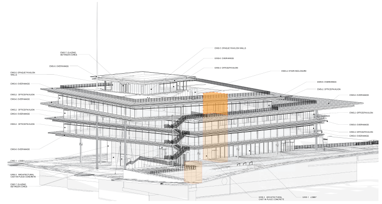
1 NE Corner L5, L6
3/16" = 1'

Sheets Referenced: 1-A340, 2-A340, 1-A331



2 L5 Railing System
1.5" = 1'

Sheets Referenced: 11-A590, 13-A590



NE16 L5, L6

Daniel Castro
ARCH7102 - Integrated Building Systems II
Spring 2022

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1459 Grand Avenue, Des Moines, Iowa 50309
Renzo Piano Building Workshop with OPN Architects

KRAUSE
GATEWAY
CENTER

right: an interior rendering of the final completed model in revit.

project done in collaboration with bhavya chawla, mahnoor faheem, matthew mcdonald, and melissa holgado

boston, ma

this project tasked each group of students to fully design the architectural, structural, mechanical, and electrical systems for a multi-purpose office and events center on a constrained site. each team put forward an architectural design strategy based on the climate of their assigned location before fully developing the rest of their model. collaboration was done using autodesk's bim collaborate pro platform and conditions mirrored real-life project delivery requirements.

harvard yard

synthesizing site, systems, and design

arch8873: integrated building systems 3
professors michael gamble, russell gentry, howard wertheimer, and scott mowinski
fall 2022

current page: select sheets from the general notes set. the general set included a cover page with index (bottom), an environmental assessment (top) with climate diagrams (middle), a code data summary sheet, and ada accessibility guidelines.

BOSTON, MASSACHUSETTS ENVIRONMENTAL ASSESSMENT

*Note: Additional Geotechnical, Seismic, and Soil Assessments can be found on sheet S001

CLIMATE

Boston, Massachusetts is located along Boston Harbor, which opens into the larger Massachusetts Bay and Atlantic Ocean. Situated in the northeastern portion of the United States, Boston features warm and humid summers (with high temperatures averaging around 82 degrees F in July) and cold and stormy winters (with low temperatures averaging around 23 degrees F in December). In the spring and fall, temperatures are usually milder. Prevailing winds from the Atlantic Ocean keep conditions more suitable for rain than snow during the winter. Boston experiences rainfall throughout the year, with slight peaks during the spring and fall. The region also sees significant amounts of snowfall, due to its susceptibility to Nor'easter weather systems that bring blizzard-like conditions to the area. Snowfall typically occurs from November to April, with the occasional early and late season snow. Despite its penchant for receiving precipitation, Boston also receives a high amount of sunshine, averaging over 2,600 hours of daylight per year.

CLIMATIC RECOMMENDATIONS AND DECISIONS

For Boston's climate, the following design decisions have been made. During the winter months, the structure should be able to protect from harsh cold winds from the northwest and funnel light in from the south. As a result, the building is oriented north-south with louvered fenestration along the south façade to allow light to permeate through as needed. The primary entrance is located along the shielded southwest corner of the building, with a back exit located along the northwest face of the building, and vestibules to transition from the frigid temperatures of Boston to the milder controlled indoor climate. The vestibules installed at both exits serve to keep the heat in and the cold out during the winter. During summer months, winds prevail from the southwest to the northeast and provide cool air to an otherwise hot and humid environment. As a result, means of accessing the building are located at the southwest and northeast to facilitate air flow through the building. The louvers along the south façade are utilized to mitigate heat gain during the warmer summer months. A set back at the southwest entrance allows for a shaded entryway during the late afternoon, when solar heat gain is the highest. Due to the region's high amounts of precipitation, particularly in December and March, a rainwater collection system is utilized for greywater reclamation. Due to Boston's high amounts of solar exposure, a network of solar panels is utilized on the roof to assist in meeting the energy demands of the structure.

TOPOGRAPHY AND GEOLOGY

Boston is characterized by the convergence of two rivers – Mystic River to the north and Charles River to the south – to create a series of channels that form the larger Boston Harbor. A series of islands flanks the Harbor to the east before emptying into Massachusetts Bay. Boston's highest point is Bellevue Hill at 330 feet, with a typical height of 19 feet above sea level.
Boston and its environs have a rich geologic history that was largely shaped as a result of Ice Age glaciers, as their retreat left behind a depression in the Earth's bedrock – present-day Boston Harbor. Additionally, Boston was the site of a shallow sea ecosystem that was subsequently uplifted, allowing for a wide array of sedimentary and metamorphic rocks to make up Boston's geology. The region's sedimentary rocks are much softer compared to those in most of New England and are thus more easily eroded. Later human interventions have added a layer of top fill to Boston's soils, which are at significant risk to subsidence. These risks are further exacerbated by sea level rise.

SOILS DESCRIPTION

The soil on site consists of the following layers. At the top is a layer of topsoil, with a depth of 2 to 12 inches, consisting of fine-medium sand, silt, and organic matter. Below is a layer of fill, with a depth of 2.5 to 8 feet, consisting of fine-medium fine-coarse sand, silt, gravel, cobbles/boulders, and debris. The ground water line exists in this layer, with a depth of 3 to 6.5 feet below grade. These two layers cover a former marshland. Below the fill layer is a layer of organics, with a depth of 2 to 20 feet, consisting of peat, silt, and organic fibers/wood. The shear strength of this layer is 0.1 tons per square foot to 0.32-0.35 tons per square foot, which is too low to bear on and will cause subsidence. Below is a layer of sandy silt and clay about 6 feet deep, and below that is a layer of silty clay about 13 feet deep. The layer of silty clay consists of over-consolidated hard to very stiff crust over a layer of softer clay before reaching bedrock below. A structure on these layers of soil without any measures taken to prevent settlement would see approximately 6 inches of settlement over 20 years with ± 1 foot of grade raise and would see differential settlement due to the varying thickness of organic soils.

FOUNDATION RECOMMENDATIONS AND DECISIONS

As a result of Boston's loose topsoil and the risk of subsidence, helical piles have been utilized to anchor the structure to the bedrock below. These helical piles need to extend 45 feet into the ground to reach suitable soils for anchorage. In addition to helical piles, a structural slab has been installed to account for differential settlement and increased loads due to assembly and water collection functions at the first level of the structure.

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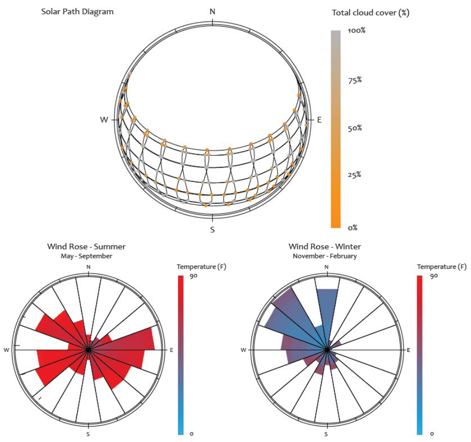
MAD ARCHITECTS | BOSTON

SHEET TITLE
Environmental Assessment

SHEET NUMBER
G002

ALL DIMENSIONS ARE IN Ft. In.

PHASE 4



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SHEET TITLE
Climate Analysis

SHEET NUMBER
G003

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PHASE 4

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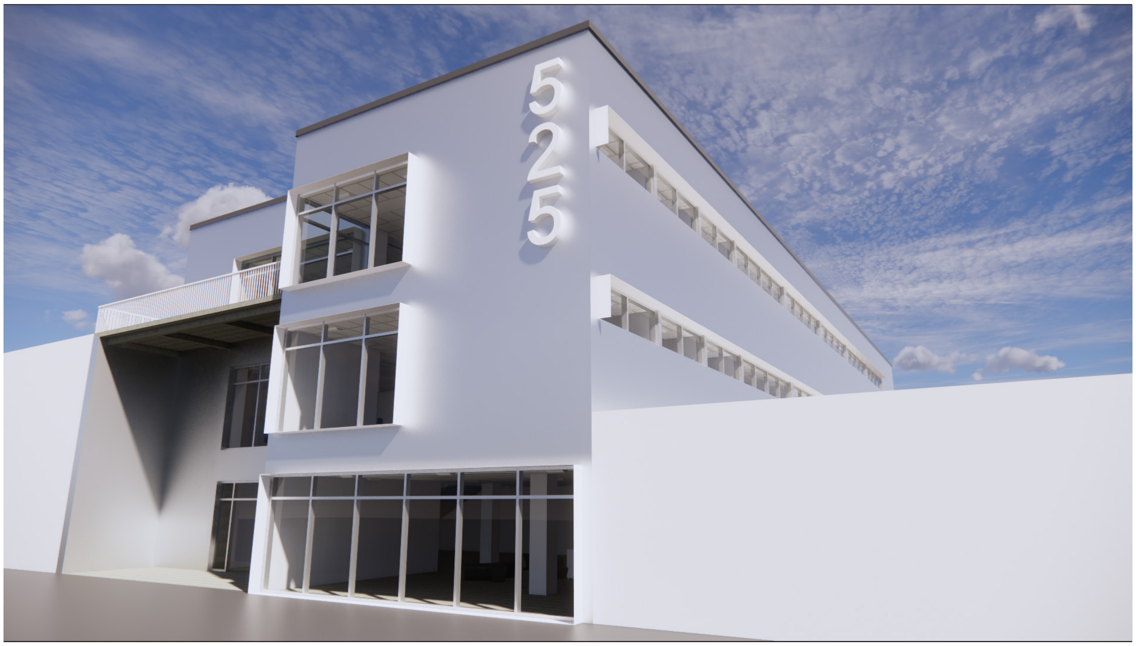

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G102 LIFE SAFETY EGRESS PLAN LEVEL 02
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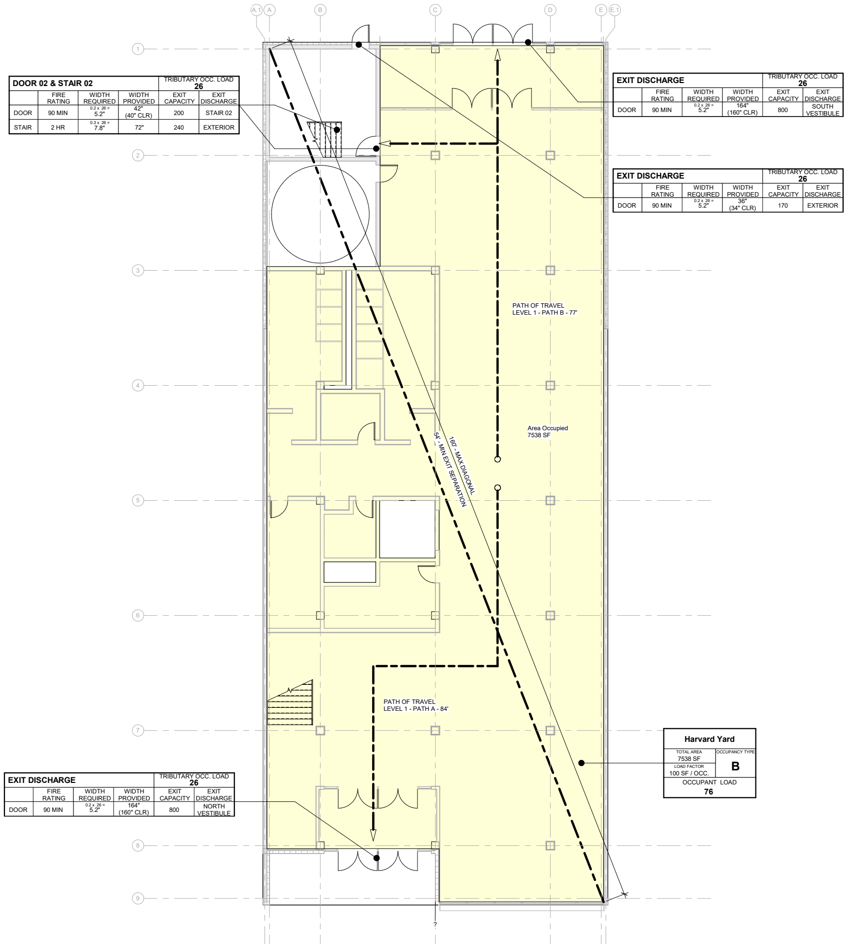
PHASE 4

INTEGRATED BUILDING SYSTEMS III

BHAVYA CHAWLA
DANIEL CASTRO
MAHNOOR FAHEEM
MATTHEW MCDONALD
MELISSA HOLGADO


A.1
A
B
C
D
E
E.1
1
2
3
4
5
6
7
8
9
PATH OF TRAVEL
LEVEL 1 - PATH B - 77'
Area Occupied
7538 SF
160' - MAX DIAGONAL
54' - MIN EXIT SEPARATION
PATH OF TRAVEL
LEVEL 1 - PATH A - 84'
?

DOOR 02 & STAIR 02				TRIBUTARY OCC. LOAD 26	
	FIRE RATING	WIDTH REQUIRED	WIDTH PROVIDED	EXIT CAPACITY	EXIT DISCHARGE
DOOR	90 MIN	0.2 x 26 = 5.2"	42" (40" CLR)	200	STAIR 02
STAIR	2 HR	0.3 x 26 = 7.8"	72"	240	EXTERIOR

EXIT DISCHARGE				TRIBUTARY OCC. LOAD 26	
	FIRE RATING	WIDTH REQUIRED	WIDTH PROVIDED	EXIT CAPACITY	EXIT DISCHARGE
DOOR	90 MIN	0.2 x 26 = 5.2"	164" (160" CLR)	800	SOUTH VESTIBULE

EXIT DISCHARGE				TRIBUTARY OCC. LOAD 26	
	FIRE RATING	WIDTH REQUIRED	WIDTH PROVIDED	EXIT CAPACITY	EXIT DISCHARGE
DOOR	90 MIN	0.2 x 26 = 5.2"	36" (34" CLR)	170	EXTERIOR

EXIT DISCHARGE				TRIBUTARY OCC. LOAD 26	
	FIRE RATING	WIDTH REQUIRED	WIDTH PROVIDED	EXIT CAPACITY	EXIT DISCHARGE
DOOR	90 MIN	0.2 x 26 = 5.2"	164" (160" CLR)	800	NORTH VESTIBULE

Harvard Yard	
TOTAL AREA 7538 SF	OCCUPANCY TYPE B
LOAD FACTOR 100 SF / OCC.	
OCCUPANT LOAD 76	

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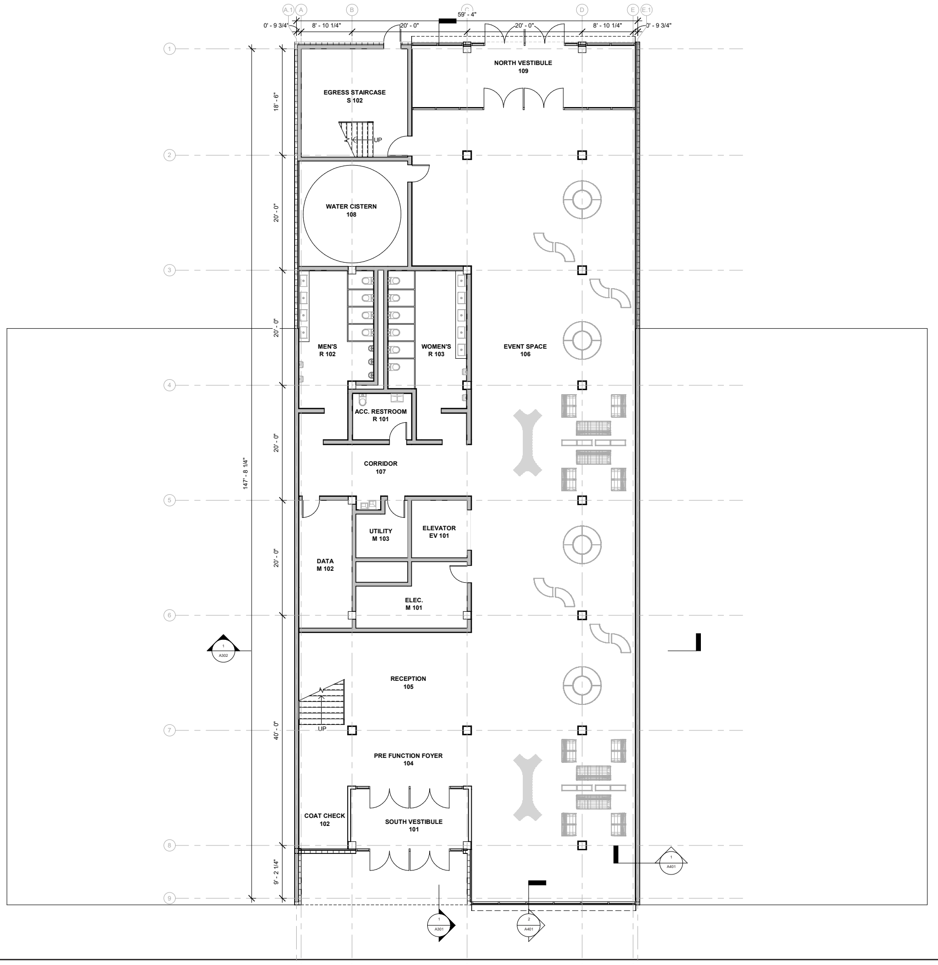
MAD ARCHITECTS | BOSTON

SHEET TITLE
Life Safety Egress Plan
Level 01

SHEET NUMBER
G101

ALL DIMENSIONS ARE IN Ft. In.
1/16" = 1' SCALE

PHASE 4


A.1
A
B
C
D
E
E.1
0' - 9 3/4"
8' - 10 1/4"
20' - 0"
59' - 4"
20' - 0"
8' - 10 1/4"
0' - 9 3/4"
1
2
3
4
5
6
7
8
9
18' - 6"
20' - 0"
20' - 0"
20' - 0"
20' - 0"
40' - 0"
9' - 2 1/4"
147' - 8 1/4"
NORTH VESTIBULE
109
EGRESS STAIRCASE
S 102
UP
WATER CISTERN
108
MEN'S
R 102
WOMEN'S
R 103
EVENT SPACE
106
ACC. RESTROOM
R 101
CORRIDOR
107
UTILITY
M 103
ELEVATOR
EV 101
DATA
M 102
ELEC.
M 101
1
A302
RECEPTION
105
UP
PRE FUNCTION FOYER
104
COAT CHECK
102
SOUTH VESTIBULE
101
1
A401
A301
2
A401

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MAD ARCHITECTS | BOSTON

SHEET TITLE
Level 01 Floor Plan

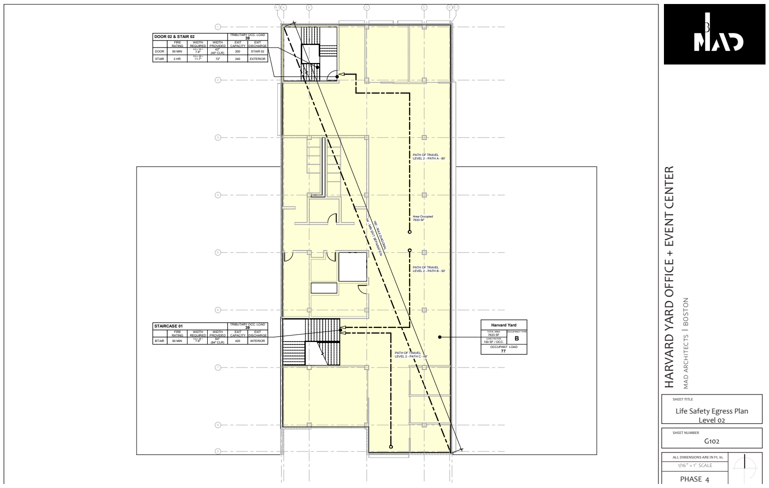
SHEET NUMBER
A101

ALL DIMENSIONS ARE IN Ft. In.
1/16" = 1' SCALE

PHASE 4

top half, opposite and current page: life safety egress level 1 (opposite page), level 2 (top right), and level 3 (bottom right) plans from the general set.

bottom half, opposite and current page: level 1 (opposite page), level 2 (top left), and level 3 (top right) floor plans; roof plan (bottom left); and mechanical roof plan (bottom right) from the architectural set.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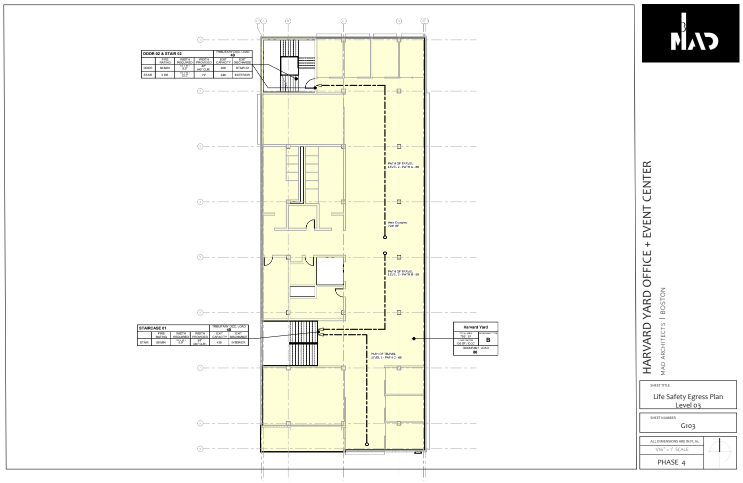
MAD ARCHITECTS | BOSTON
Life Safety Egress Plan Level 02
G102
PHASE 4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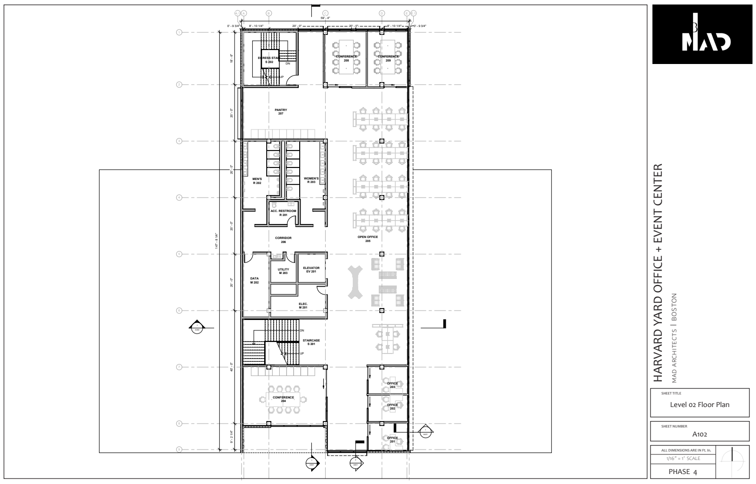
Life Safety Egress Plan Level 03
G103
PHASE 4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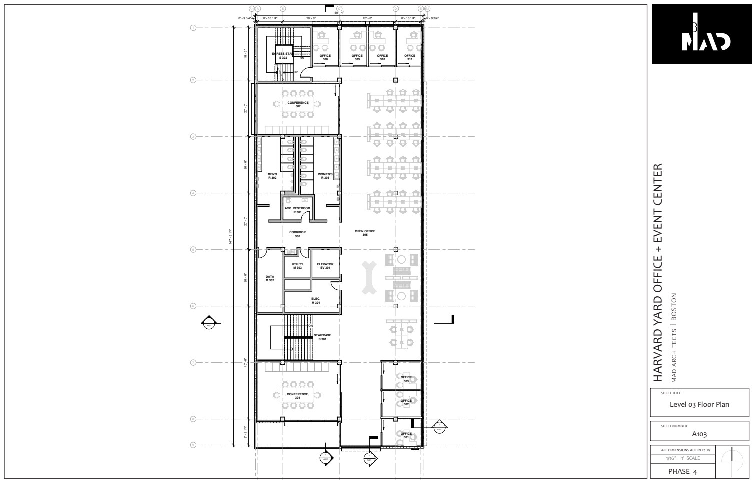
MAD ARCHITECTS | BOSTON
Level 02 Floor Plan
A102
PHASE 4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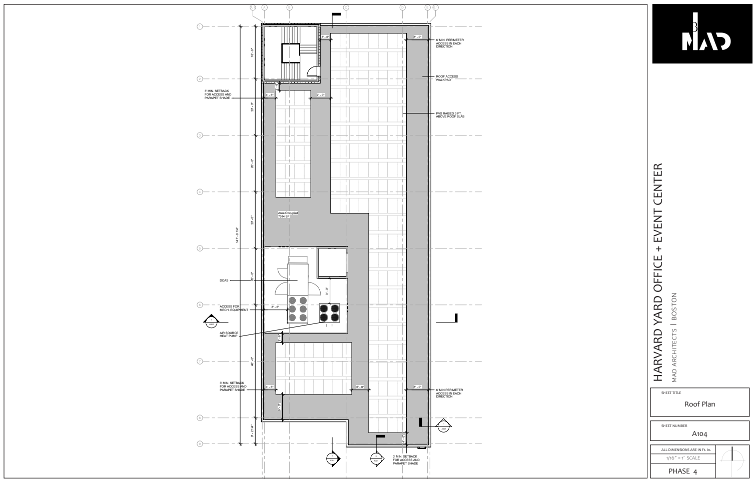
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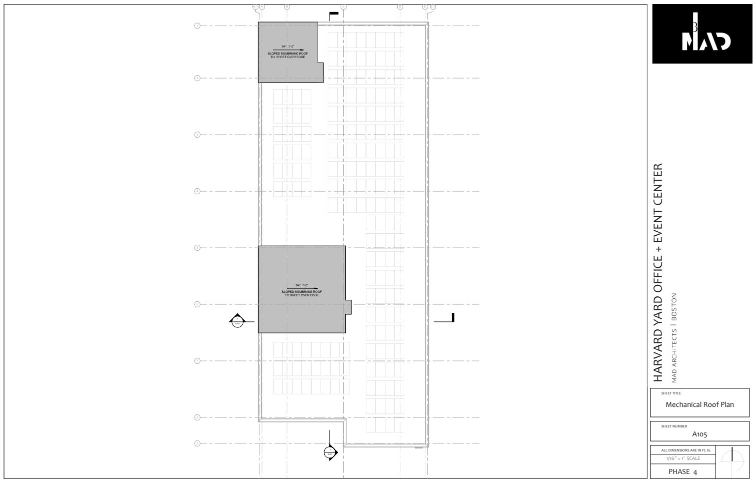
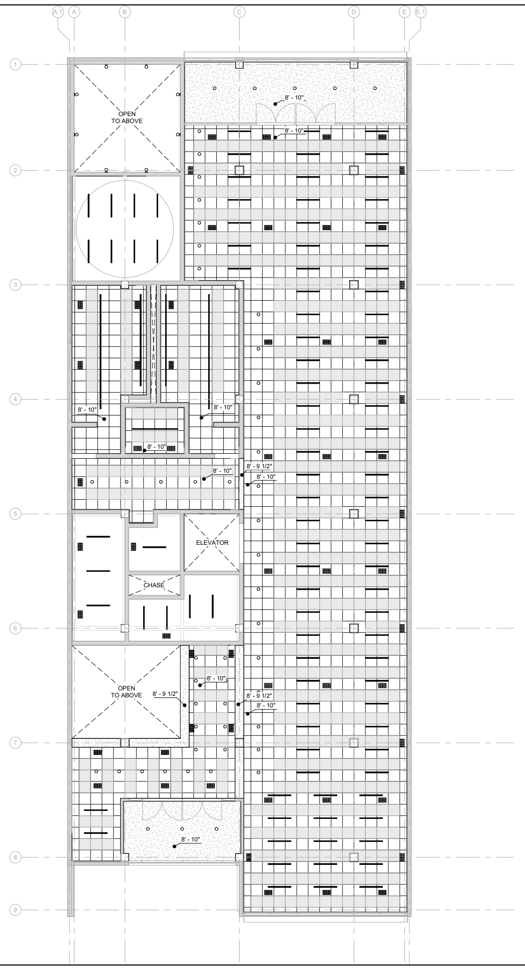
MAD ARCHITECTS | BOSTON
Roof Plan
A104
PHASE 4


MAD
HARVARD YARD OFFICE + EVENT CENTER
MAD ARCHITECTS | BOSTON
Mechanical Roof Plan
A105
PHASE 4



A.1
A
B
C
D
E
E.1
1
2
3
4
5
6
7
8
9
OPEN TO ABOVE
ELEVATOR
CHASE
OPEN TO ABOVE
8' - 10"
8' - 9 1/2"

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MAD ARCHITECTS | BOSTON

SHEET TITLE

Level 01 RCP

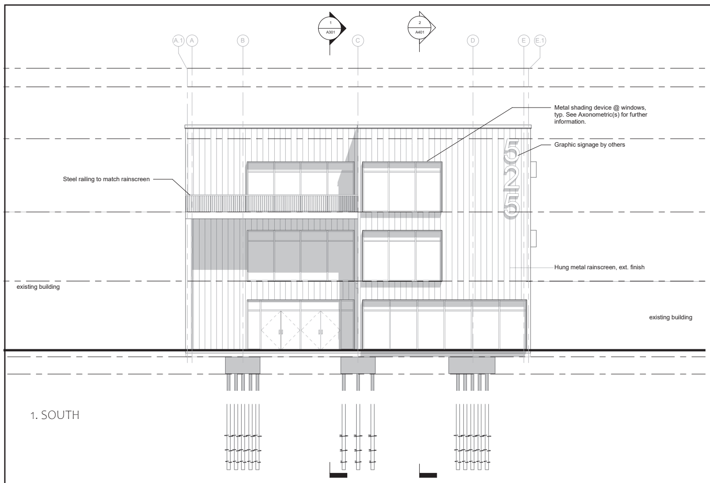
SHEET NUMBER

A111

ALL DIMENSIONS ARE IN Ft. In.

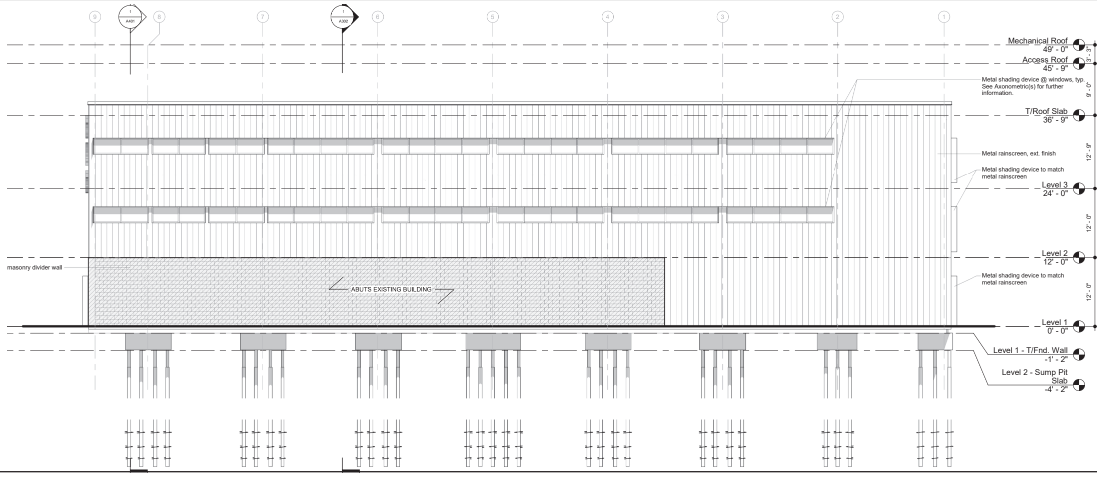
1/16" = 1' SCALE

PHASE 4



1
A301
2
A401
A.1
A
B
C
D
E
E.1
Metal shading device @ windows, typ. See Axonometric(s) for further information.
Graphic signage by others
525
Steel railing to match rainscreen
Hung metal rainscreen, ext. finish
existing building
existing building

1. SOUTH



9
1
A401
8
7
1
A302
6
5
4
3
2
1
Mechanical Roof
49' - 0"
Access Roof
45' - 9"
Metal shading device @ windows, typ. See Axonometric(s) for further information.
T/Roof Slab
36' - 9"
Metal rainscreen, ext. finish
Metal shading device to match metal rainscreen
Level 3
24' - 0"
Level 2
12' - 0"
masonry divider wall
ABUTS EXISTING BUILDING
Metal shading device to match metal rainscreen
Level 1
0' - 0"
Level 1 - T/Fnd. Wall
-1' - 2"
Level 2 - Sump Pit Slab
-4' - 2"
3' - 3"
9' - 0"
12' - 9"
12' - 0"
12' - 0"

2. EAST

HARVARD YARD OFFICE + EVENT CENTER

MAD ARCHITECTS | BOSTON

SHEET TITLE

South and East Elevations

SHEET NUMBER

A201

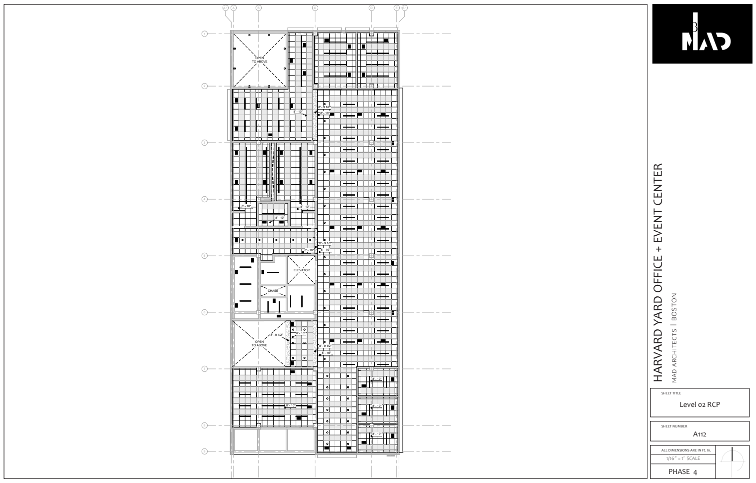
ALL DIMENSIONS ARE IN Ft. In.

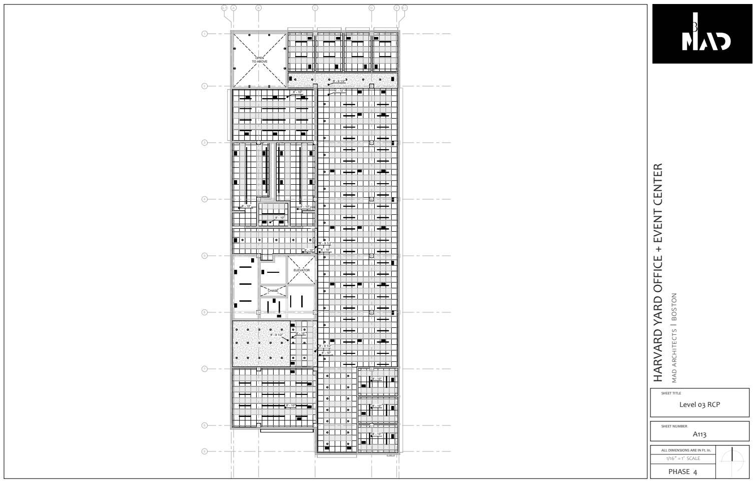
1/16" = 1' SCALE

PHASE 4

top half, opposite and current page: reflective ceiling level 1 (opposite page), level 2 (top right), and level 3 (bottom right) plans from the architectural set.

bottom half, opposite and current page: south and east elevations (opposite page); north and west elevations (top left); longitudinal (top right) and transverse (bottom left) building sections; and wall sections (bottom right) from the architectural set.


MAD
HARVARD YARD OFFICE + EVENT CENTER
MAD ARCHITECTS | BOSTON
SHEET TITLE
Level 02 RCP
SHEET NUMBER
A112
ALL DIMENSIONS ARE IN FT. IN.
1/16" = 1' SCALE
PHASE 4


MAD
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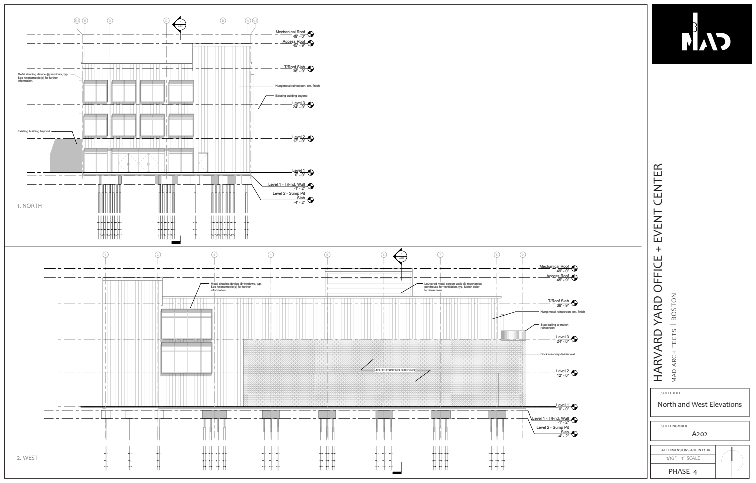
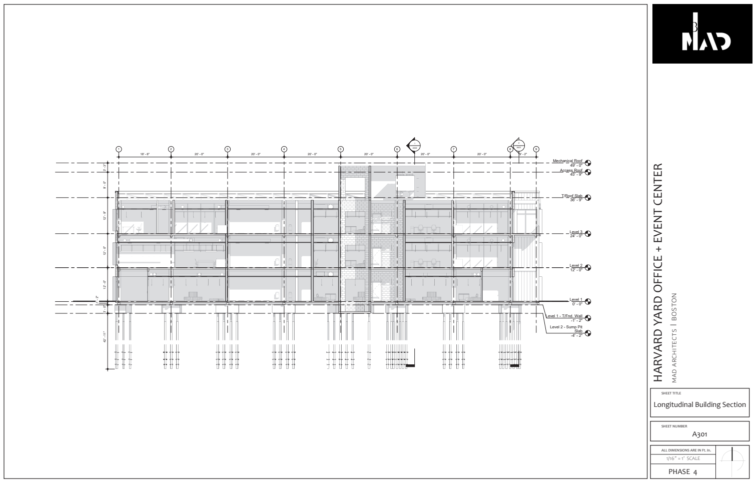
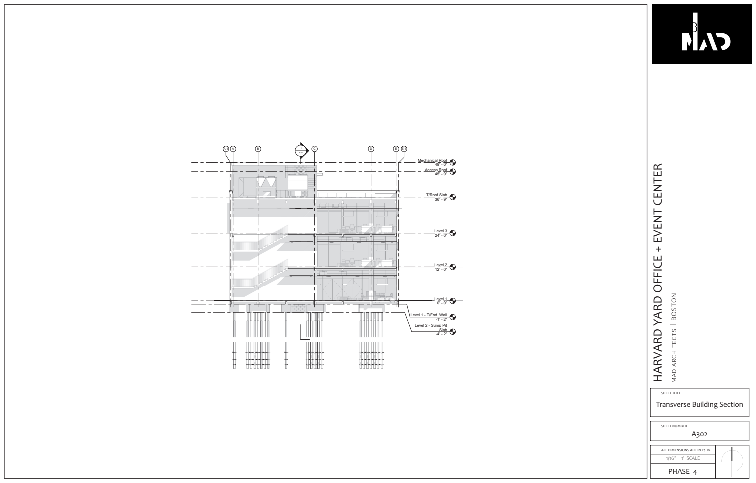
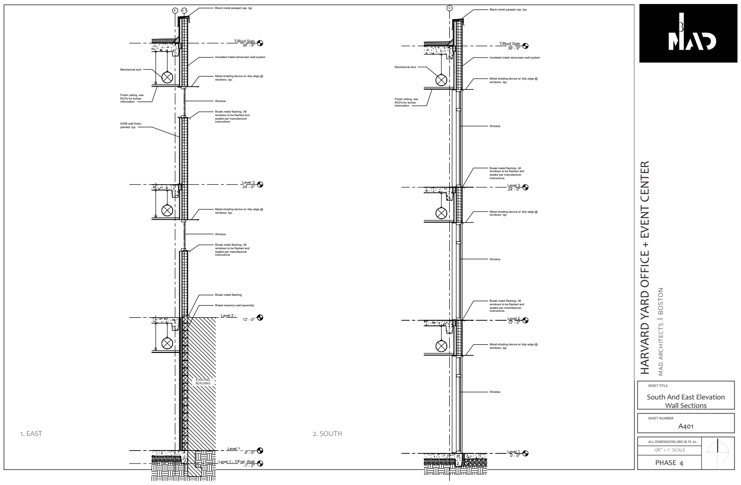
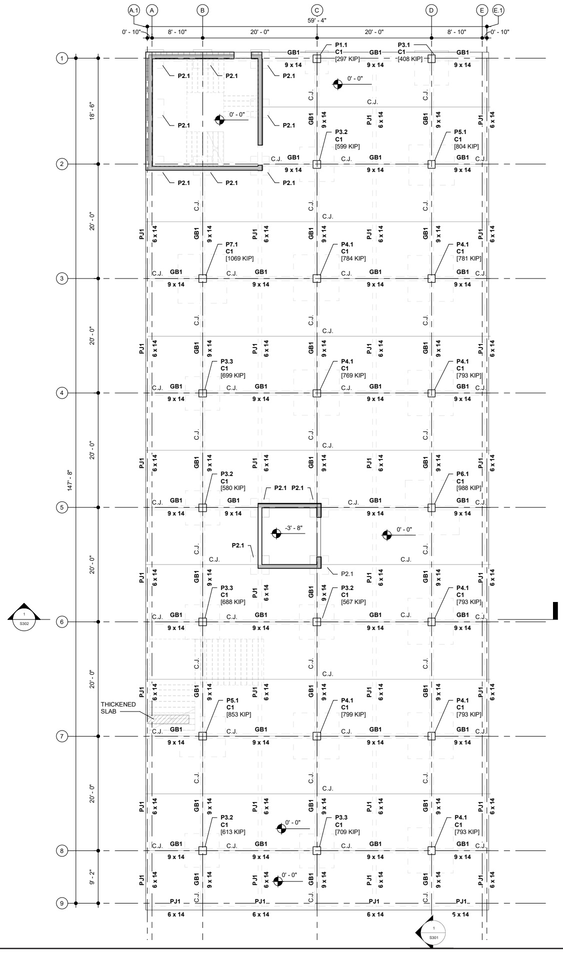
MAD ARCHITECTS | BOSTON
SHEET TITLE
Level 03 RCP
SHEET NUMBER
A113
ALL DIMENSIONS ARE IN FT. IN.
1/16" = 1' SCALE
PHASE 4


1. NORTH
2. WEST
MAD
HARVARD YARD OFFICE + EVENT CENTER
MAD ARCHITECTS | BOSTON
SHEET TITLE
North and West Elevations
SHEET NUMBER
A202
ALL DIMENSIONS ARE IN FT. IN.
1/16" = 1' SCALE
PHASE 4


MAD
HARVARD YARD OFFICE + EVENT CENTER
MAD ARCHITECTS | BOSTON
SHEET TITLE
Longitudinal Building Section
SHEET NUMBER
A301
ALL DIMENSIONS ARE IN FT. IN.
1/16" = 1' SCALE
PHASE 4


MAD
HARVARD YARD OFFICE + EVENT CENTER
MAD ARCHITECTS | BOSTON
SHEET TITLE
Transverse Building Section
SHEET NUMBER
A302
ALL DIMENSIONS ARE IN FT. IN.
1/16" = 1' SCALE
PHASE 4


1. EAST
2. SOUTH
MAD
HARVARD YARD OFFICE + EVENT CENTER
MAD ARCHITECTS | BOSTON
SHEET TITLE
South And East Elevation Wall Sections
SHEET NUMBER
A401
ALL DIMENSIONS ARE IN FT. IN.
3/8" = 1' SCALE
PHASE 4


A.1
A
B
C
D
E
E.1
59' - 4"
0' - 10"
8' - 10"
20' - 0"
20' - 0"
8' - 10"
0' - 10"
1
2
3
4
5
6
7
8
9
18' - 6"
20' - 0"
20' - 0"
20' - 0"
147' - 8"
20' - 0"
20' - 0"
20' - 0"
9' - 2"
P1.1 C1 [297 KIP]
P3.1 C1 [408 KIP]
P2.1
P3.2 C1 [599 KIP]
P5.1 C1 [804 KIP]
P7.1 C1 [1069 KIP]
P4.1 C1 [784 KIP]
P4.1 C1 [781 KIP]
P3.3 C1 [699 KIP]
P4.1 C1 [769 KIP]
P4.1 C1 [793 KIP]
P3.2 C1 [580 KIP]
P6.1 C1 [988 KIP]
P3.3 C1 [688 KIP]
P3.2 C1 [567 KIP]
P4.1 C1 [793 KIP]
P5.1 C1 [853 KIP]
P4.1 C1 [799 KIP]
P4.1 C1 [793 KIP]
P3.2 C1 [613 KIP]
P3.3 C1 [709 KIP]
P4.1 C1 [793 KIP]
GB1
9 x 14
PJ1
6 x 14
C.J.
0' - 0"
-3' - 8"
THICKENED SLAB
S002
S001

BEAM AND JOIST LEGEND

MARK	TYPE	DIMENSIONS	COMMENTS
GB1	CONC. GRADE BEAM	9"W x 14"D	SEE STRUCTURAL DETAILS FOR FURTHER INFO
B1	REINF. CONC. BEAM	9"W x 14"D	SEE STRUCTURAL DETAILS FOR FURTHER INFO
PJ1	REINF. CONC. PAN JOIST	6"W x 14"D	SEE STRUCTURAL DETAILS FOR FURTHER INFO

COLUMN LEGEND

MARK	TYPE	DIMENSIONS	COMMENTS
C1	REINF. CONC. COLUMN	16"W x 16"L	SEE STRUCTURAL DETAILS FOR FURTHER INFO

PILE / FOOTING LEGEND

MARK	PILE TYPE	CAP DIMENSIONS	PILE DEPTH	PILES PER CAP	COMMENTS
P1.1	HELICAL	4'-0"W x 4'-0"L x 3'-0"H	47'-0"	4	Helical piles spaced 30" O.C. in accordance with MA state building code
P2.1	HELICAL	3'-3"W x 3'-3"L x 3'-0"H	47'-0"	1	-
P3.1	HELICAL	6'-0"W x 6'-0"L x 3'-0"H	47'-0"	6	Helical piles spaced 30" O.C. in accordance with MA state building code
P3.2	HELICAL	6'-0"W x 6'-0"L x 3'-0"H	47'-0"	8	Helical piles spaced 30" O.C. in accordance with MA state building code
P3.3	HELICAL	6'-0"W x 6'-0"L x 3'-0"H	47'-0"	9	Helical piles spaced 30" O.C. in accordance with MA state building code
P4.1	HELICAL	8'-0"W x 8'-0"L x 3'-0"H	47'-0"	10	Helical piles spaced 30" O.C. in accordance with MA state building code
P5.1	HELICAL	8'-0"W x 7'-0"L x 3'-0"H	47'-0"	11	Helical piles spaced 30" O.C. in accordance with MA state building code
P6.1	HELICAL	9'-6"W x 9'-6"L x 3'-0"H	47'-0"	13	Helical piles spaced 30" O.C. in accordance with MA state building code
P7.1	HELICAL	8'-6"W x 8'-6"L x 3'-0"H	47'-0"	14	Helical piles spaced 30" O.C. in accordance with MA state building code

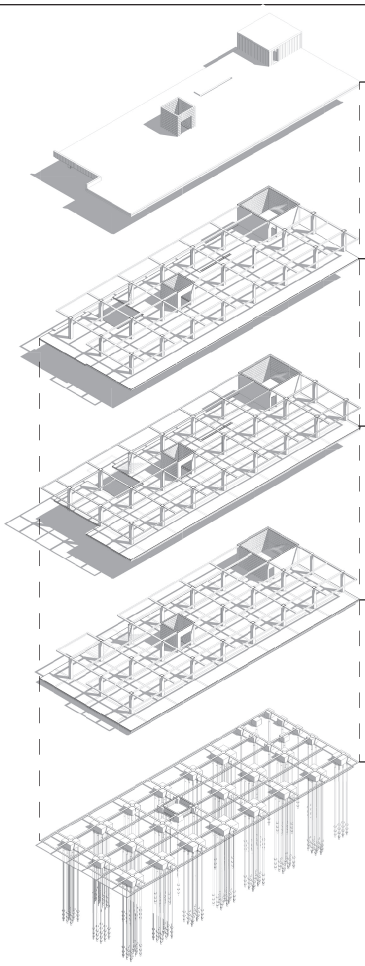
HARVARD YARD OFFICE + EVENT CENTER

MAD ARCHITECTS | BOSTON

SHEET TITLE
Level 01 Framing Plan

SHEET NUMBER
S101

ALL DIMENSIONS ARE IN Ft. In.
1/16" = 1' SCALE
PHASE 4



ROOF

Roof slab
Shear walls

LEVEL 3

L3 slab
L3 columns
Shear walls
Roof pan-joist system

LEVEL 2

L2 slab
L2 columns
Shear walls
L3 pan-joist system

LEVEL 1

L1 slab
L1 columns
Shear walls
L2 pan-joist system

BELOW-GRADE FOUNDATIONS

Helical piles
Pile cap
Sump pit
Structural grade beams

HARVARD YARD OFFICE + EVENT CENTER

MAD ARCHITECTS | BOSTON

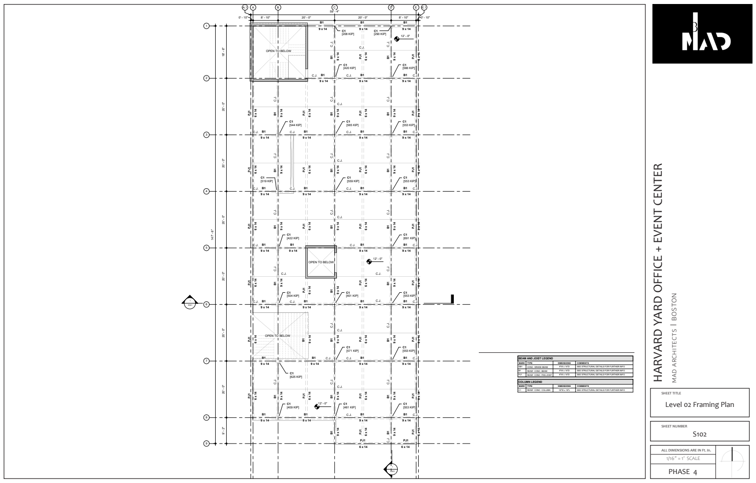
SHEET TITLE
Structural Axon

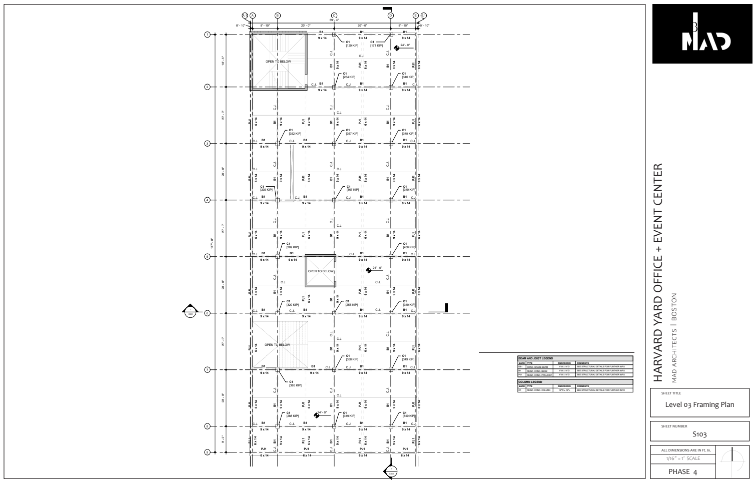
SHEET NUMBER
S003

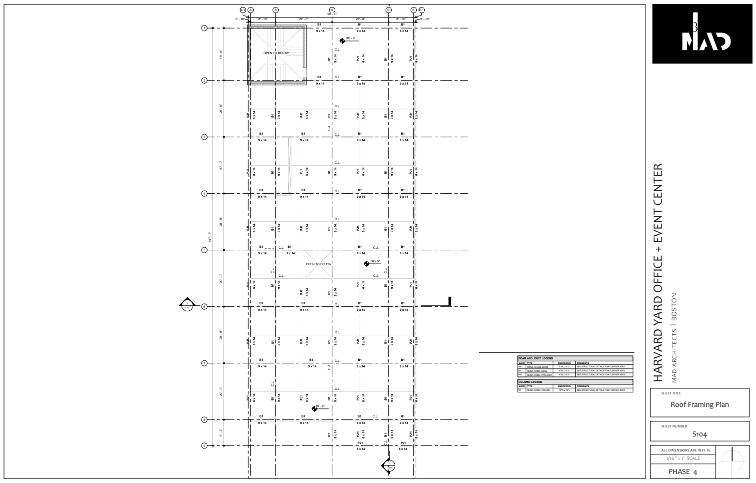
ALL DIMENSIONS ARE IN Ft. In.
NOT TO SCALE
PHASE 4

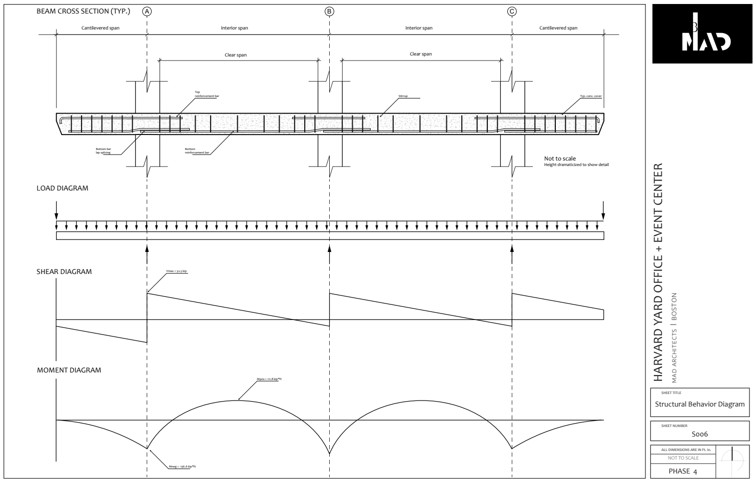
top half, opposite and current page: structural framing foundation (opposite page), level 2 (top left), level 3 (bottom left), and roof (bottom right) plans from the structural set.

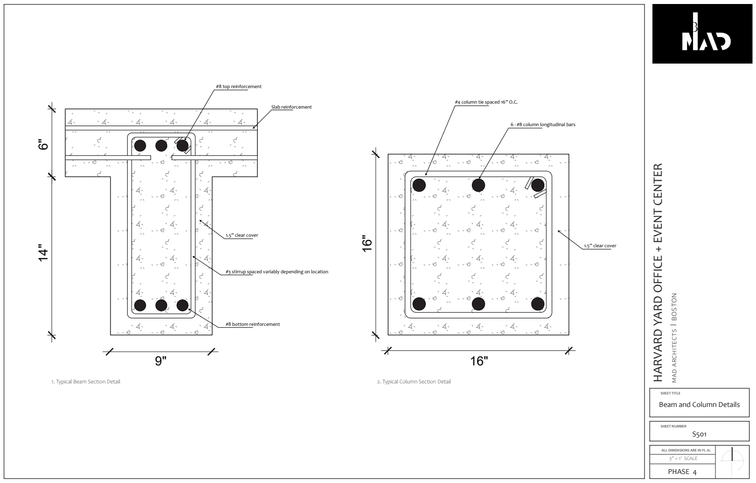
bottom half, opposite and current page: exploded structural axon (opposite page), structural behavior diagrams (top left), beam and column detail sections (top right), typical foundation details (bottom left), and enclosure to structure details (bottom right) from the structural set.

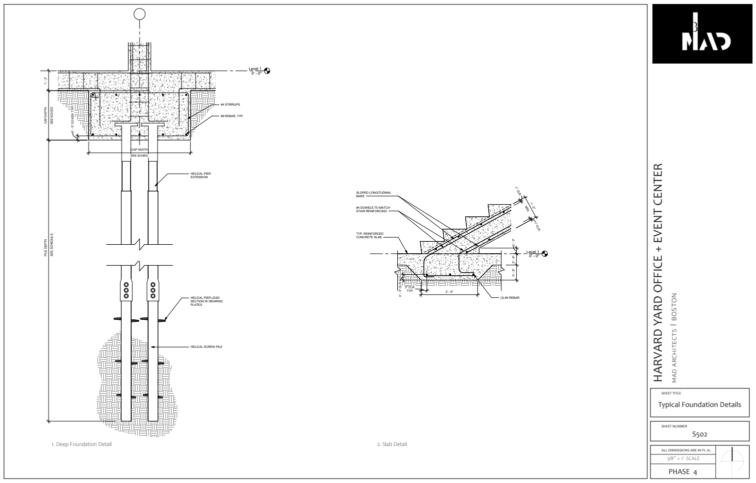

OPEN TO BELOW
B1
8 x 14
MAD
HARVARD YARD OFFICE + EVENT CENTER
MAD ARCHITECTS | BOSTON
SHEET TITLE
Level 02 Framing Plan
SHEET NUMBER
S102
ALL DIMENSIONS ARE IN FT. IN.
1/16" = 1' SCALE
PHASE 4

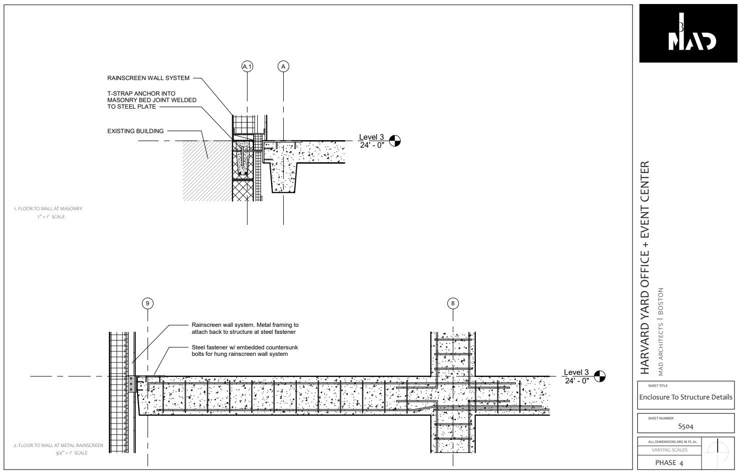

OPEN TO BELOW
B1
8 x 14
MAD
HARVARD YARD OFFICE + EVENT CENTER
MAD ARCHITECTS | BOSTON
SHEET TITLE
Level 03 Framing Plan
SHEET NUMBER
S103
ALL DIMENSIONS ARE IN FT. IN.
1/16" = 1' SCALE
PHASE 4

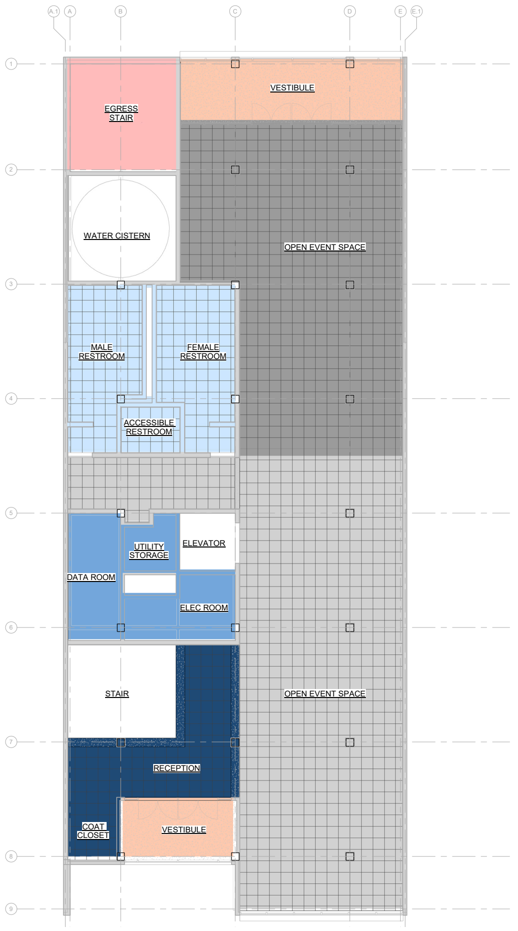

OPEN TO BELOW
B1
8 x 14
MAD
HARVARD YARD OFFICE + EVENT CENTER
MAD ARCHITECTS | BOSTON
SHEET TITLE
Roof Framing Plan
SHEET NUMBER
S104
ALL DIMENSIONS ARE IN FT. IN.
1/16" = 1' SCALE
PHASE 4


BEAM CROSS SECTION (TYP.)
A
B
C
Cantilevered span
Interior span
Interior span
Cantilevered span
Clear span
Clear span
Not to scale
Height dramaticized to show detail
LOAD DIAGRAM
SHEAR DIAGRAM
MOMENT DIAGRAM
MAD
HARVARD YARD OFFICE + EVENT CENTER
MAD ARCHITECTS | BOSTON
SHEET TITLE
Structural Behavior Diagram
SHEET NUMBER
S006
ALL DIMENSIONS ARE IN FT. IN.
NOT TO SCALE
PHASE 4


#8 top reinforcement
Slab reinforcement
6"
14"
9"
1.5" clear cover
#3 stirrup spaced variably depending on location
#8 bottom reinforcement
#4 column tie spaced 16" O.C.
6 - #8 column longitudinal bars
16"
16"
1.5" clear cover
1. Typical Beam Section Detail
2. Typical Column Section Detail
MAD
HARVARD YARD OFFICE + EVENT CENTER
MAD ARCHITECTS | BOSTON
SHEET TITLE
Beam and Column Details
SHEET NUMBER
S501
ALL DIMENSIONS ARE IN FT. IN.
1" = 1' SCALE
PHASE 4


Level 1
#4 STIRRUPS
#8 REBAR, TYP.
HELICAL PIER EXTENSION
HELICAL PIER LEAD SECTION W/ BEARING PLATES
HELICAL SCREW PILE
SLOPED LONGITUDINAL BARS
#4 DOWELS TO MATCH STAIR REINFORCING
TYP. REINFORCED CONCRETE SLAB
(2) #4 REBAR
1. Deep Foundation Detail
2. Slab Detail
MAD
HARVARD YARD OFFICE + EVENT CENTER
MAD ARCHITECTS | BOSTON
SHEET TITLE
Typical Foundation Details
SHEET NUMBER
S502
ALL DIMENSIONS ARE IN FT. IN.
3/8" = 1' SCALE
PHASE 4


A.1
A
RAINSCREEN WALL SYSTEM
T-STRAP ANCHOR INTO MASONRY BED JOINT WELDED TO STEEL PLATE
EXISTING BUILDING
Level 3
24' - 0"
1. FLOOR TO WALL AT MASONRY
1" = 1' SCALE
9
8
Rainscreen wall system. Metal framing to attach back to structure at steel fastener
Steel fastener w/ embedded countersunk bolts for hung rainscreen wall system
Level 3
24' - 0"
2. FLOOR TO WALL AT METAL RAINSCREEN
3/4" = 1' SCALE
MAD
HARVARD YARD OFFICE + EVENT CENTER
MAD ARCHITECTS | BOSTON
SHEET TITLE
Enclosure To Structure Details
SHEET NUMBER
S504
ALL DIMENSIONS ARE IN FT. IN.
VARYING SCALES
PHASE 4



A.1
A
B
C
D
E
E.1
1
2
3
4
5
6
7
8
9
EGRESS STAIR
VESTIBULE
WATER CISTERN
OPEN EVENT SPACE
MALE RESTROOM
FEMALE RESTROOM
ACCESSIBLE RESTROOM
UTILITY STORAGE
ELEVATOR
DATA ROOM
ELEC ROOM
STAIR
OPEN EVENT SPACE
RECEPTION
COAT CLOSET
VESTIBULE

HARVARD YARD OFFICE + EVENT CENTER

MAD ARCHITECTS | BOSTON

SHEET TITLE

Zoning Plan Level 01

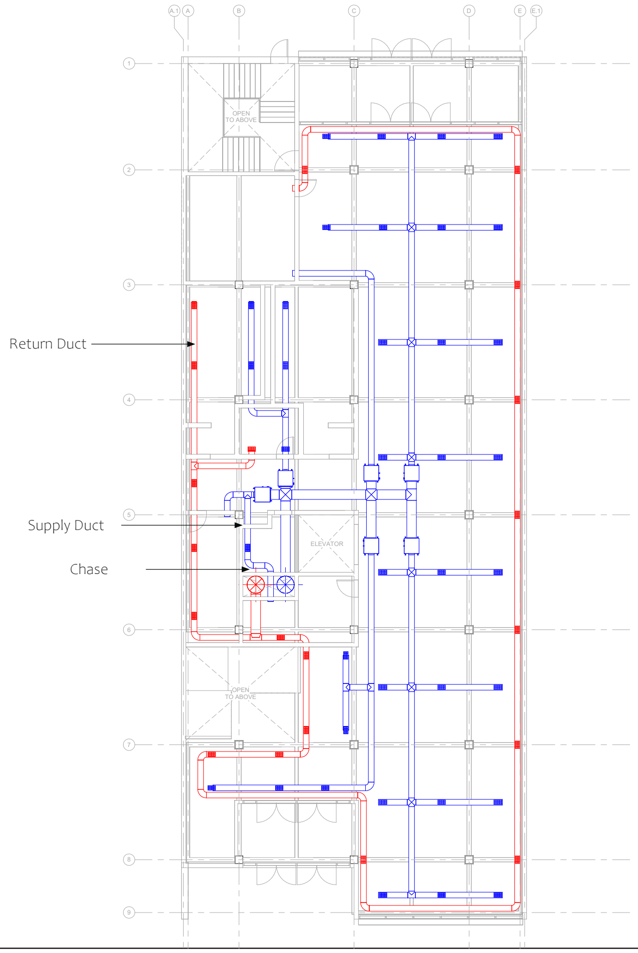
SHEET NUMBER

M101

ALL DIMENSIONS ARE IN Ft. In.

1/16" = 1' SCALE

PHASE 4



A.1
A
B
C
D
E
E.1
1
2
3
4
5
6
7
8
9
OPEN TO ABOVE
Return Duct
Supply Duct
Chase
ELEVATOR
OPEN TO ABOVE

HARVARD YARD OFFICE + EVENT CENTER

MAD ARCHITECTS | BOSTON

SHEET TITLE

Mechanical Duct Plan Level 01

SHEET NUMBER

M111

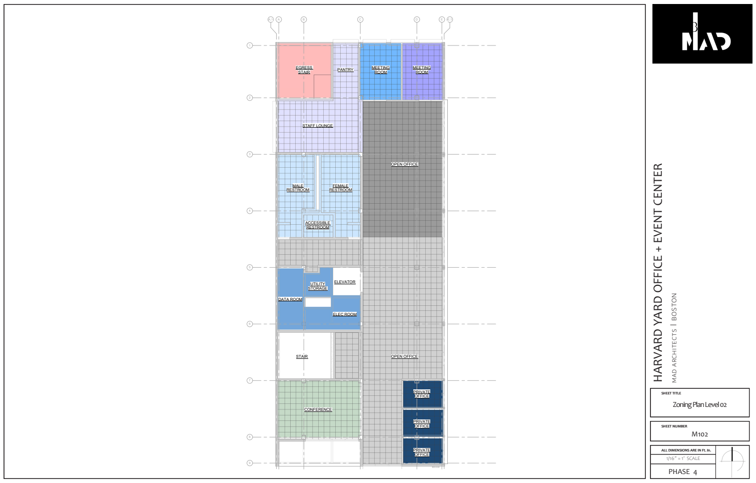
ALL DIMENSIONS ARE IN Ft. In.

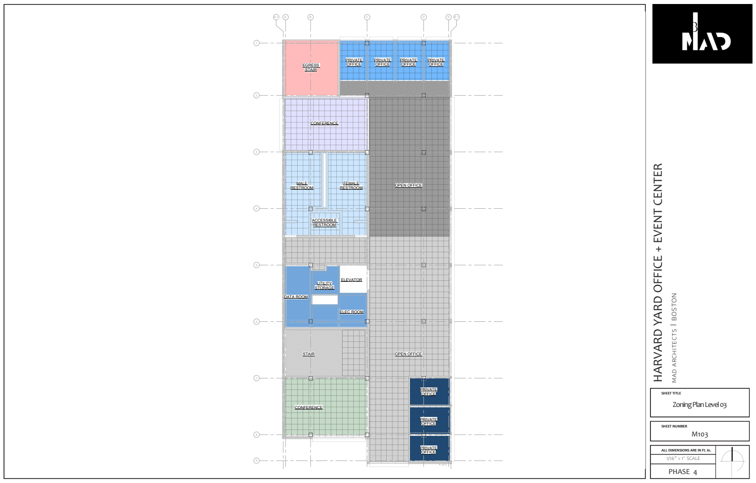
1/16" = 1' SCALE

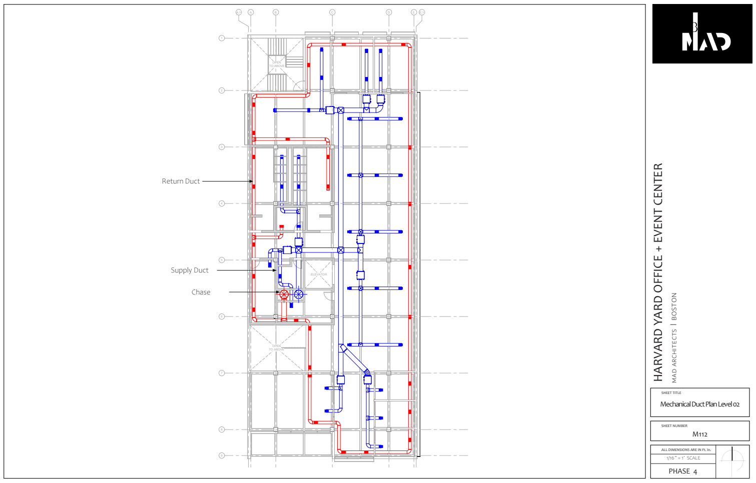
PHASE 4

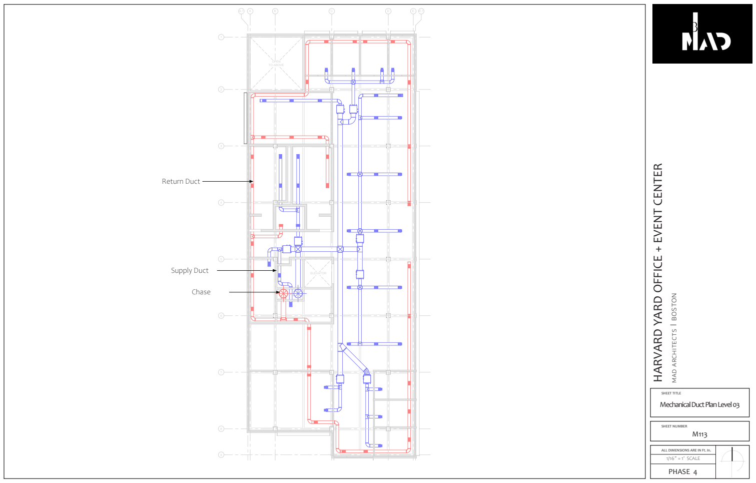
top half, opposite and current page: mechanical zoning level 1 (opposite page), level 2 (top right), and level 3 (bottom right) plans from the mechanical set.

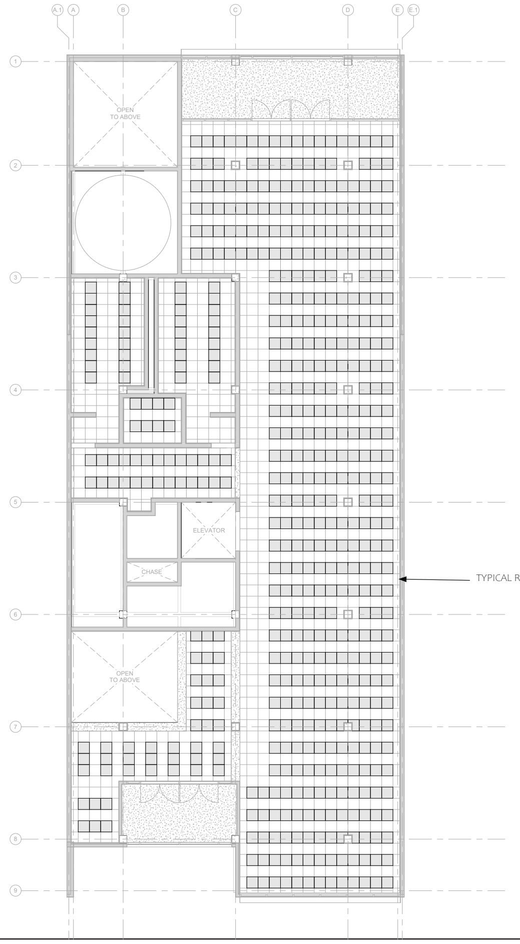
bottom half, opposite and current page: mechanical duct level 1 (opposite page), level 2 (top right), and level 3 (bottom right) plans from the mechanical set.


EGRESS STAIR
PANTRY
MEETING ROOM
MEETING ROOM
STAFF LOUNGE
OPEN OFFICE
MALE RESTROOM
FEMALE RESTROOM
ACCESSIBLE RESTROOM
UTILITY STORAGE
ELEVATOR
DATA ROOM
ELEC ROOM
STAIR
OPEN OFFICE
CONFERENCE
PRIVATE OFFICE
PRIVATE OFFICE
PRIVATE OFFICE
HARVARD YARD OFFICE + EVENT CENTER
MAD ARCHITECTS | BOSTON
SHEET TITLE
Zoning Plan Level 02
SHEET NUMBER
M102
ALL DIMENSIONS ARE IN Ft. In.
1/16" = 1' SCALE
PHASE 4


EGRESS STAIR
PRIVATE OFFICE
PRIVATE OFFICE
PRIVATE OFFICE
PRIVATE OFFICE
CONFERENCE
OPEN OFFICE
MALE RESTROOM
FEMALE RESTROOM
ACCESSIBLE RESTROOM
UTILITY STORAGE
ELEVATOR
DATA ROOM
ELEC ROOM
STAIR
OPEN OFFICE
CONFERENCE
PRIVATE OFFICE
PRIVATE OFFICE
PRIVATE OFFICE
HARVARD YARD OFFICE + EVENT CENTER
MAD ARCHITECTS | BOSTON
SHEET TITLE
Zoning Plan Level 03
SHEET NUMBER
M103
ALL DIMENSIONS ARE IN Ft. In.
1/16" = 1' SCALE
PHASE 4


Return Duct
Supply Duct
Chase
HARVARD YARD OFFICE + EVENT CENTER
MAD ARCHITECTS | BOSTON
SHEET TITLE
Mechanical Duct Plan Level 02
SHEET NUMBER
M112
ALL DIMENSIONS ARE IN Ft. In.
1/16" = 1' SCALE
PHASE 4


Return Duct
Supply Duct
Chase
HARVARD YARD OFFICE + EVENT CENTER
MAD ARCHITECTS | BOSTON
SHEET TITLE
Mechanical Duct Plan Level 03
SHEET NUMBER
M113
ALL DIMENSIONS ARE IN Ft. In.
1/16" = 1' SCALE
PHASE 4



TYPICAL RADIANT PANEL

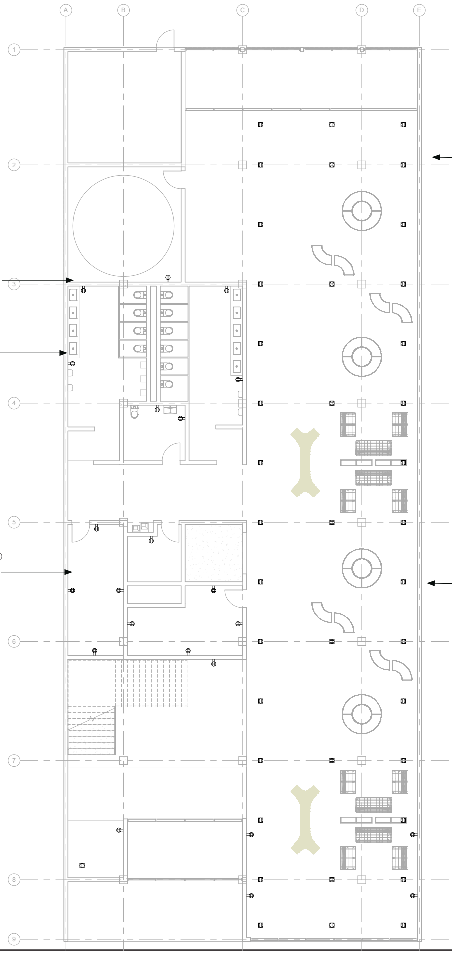
RADIANT PANELS PLACED IN A 2'x2' GRID
50% EXTERIOR SPACES
30% INTERIOR SPACES

HARVARD YARD OFFICE + EVENT CENTER
MAD ARCHITECTS | BOSTON

SHEET TITLE
Radiant Panels Level 01

SHEET NUMBER
M121

ALL DIMENSIONS ARE IN Ft. In.
1/16" = 1' SCALE
PHASE 4



FLOOR MTD DUPLEX RECEPTACLES AT EVERY STRUCTURAL BAY (20' SPACING AT STRUCTURAL BAYS) TO SATISFY CLEANING EQUIPMENT REQUIREMENT.

RECEPTACLES IN BATHROOMS AND KITCHEN WET-WALL WALLS TO BE EQUIPPED WITH G.F.C.I. PER N.E.C., TYP. SINK ADJACENT RECEPTACLES TO BE MOUNTED AT A.F.F. PER N.E.C.

WALL MTD. RECEPTACLES (48" A.F.F.) IN DEMISING WALLS; TYP, FOR B.O.H., BATHROOMS, STORAGE, ELEC, MECH, AND KITCHEN.

RECEPTACLES IN DATA ROOM AND ELEC. ROOM TO ALL BE DOUBLE DUPLEX FOR SERVER STACKS.

FLOOR RECEPTACLES TO SATISFY N.E.C. REQUIREMENT ALONG WALLS & PARTITIONS IN SHARED CORRIDORS, OFFICE LOBBY, AND EVENT SPACE. 2' O./C. FROM FINISH FACE OF WALL, TYP.

Electrical Fitting Schedule

⦶	Recessed Floor MTD. Duplex Receptacle
⊞	Recessed Floor MTD. Double Duplex Receptacle
⊖	Wall MTD. (48"A.F.F)Duplex Receptacle
⊕	Wall MTD. (48"A.F.F)Double Duplex Receptacle

HARVARD YARD OFFICE + EVENT CENTER
MAD ARCHITECTS | BOSTON

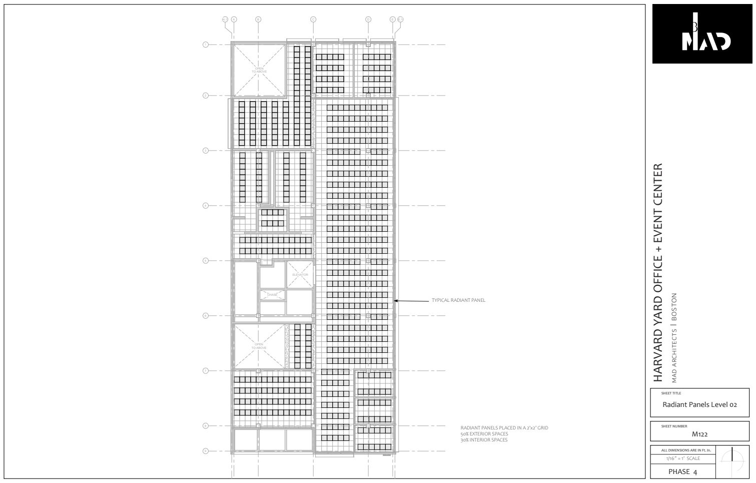
SHEET TITLE
Electrical Power Plan Level 01

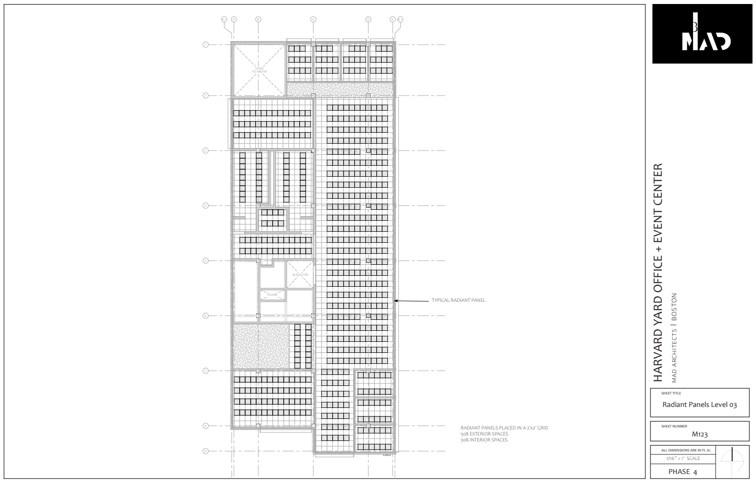
SHEET NUMBER
E101

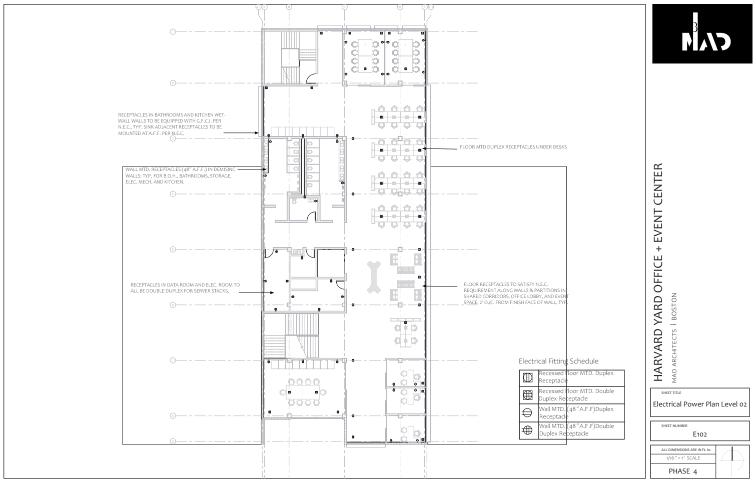
ALL DIMENSIONS ARE IN Ft. In.
1/16" = 1' SCALE
PHASE 4

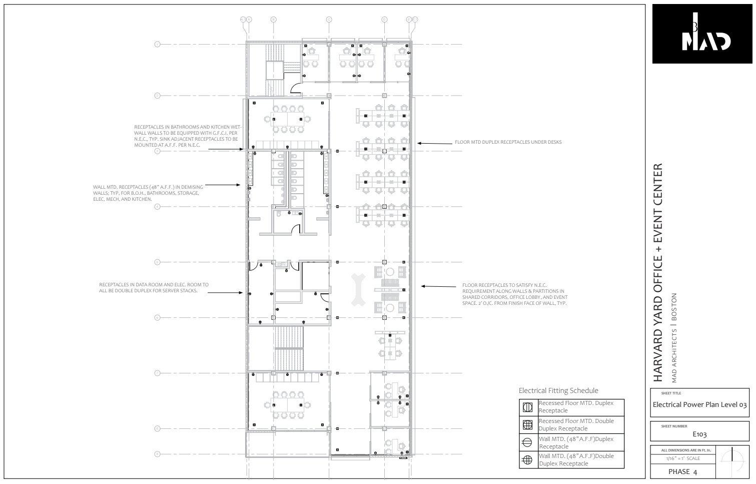
top half, opposite and current page: radiant panel level 1 (opposite page), level 2 (top right), and level 3 (bottom right) plans from the mechanical set.

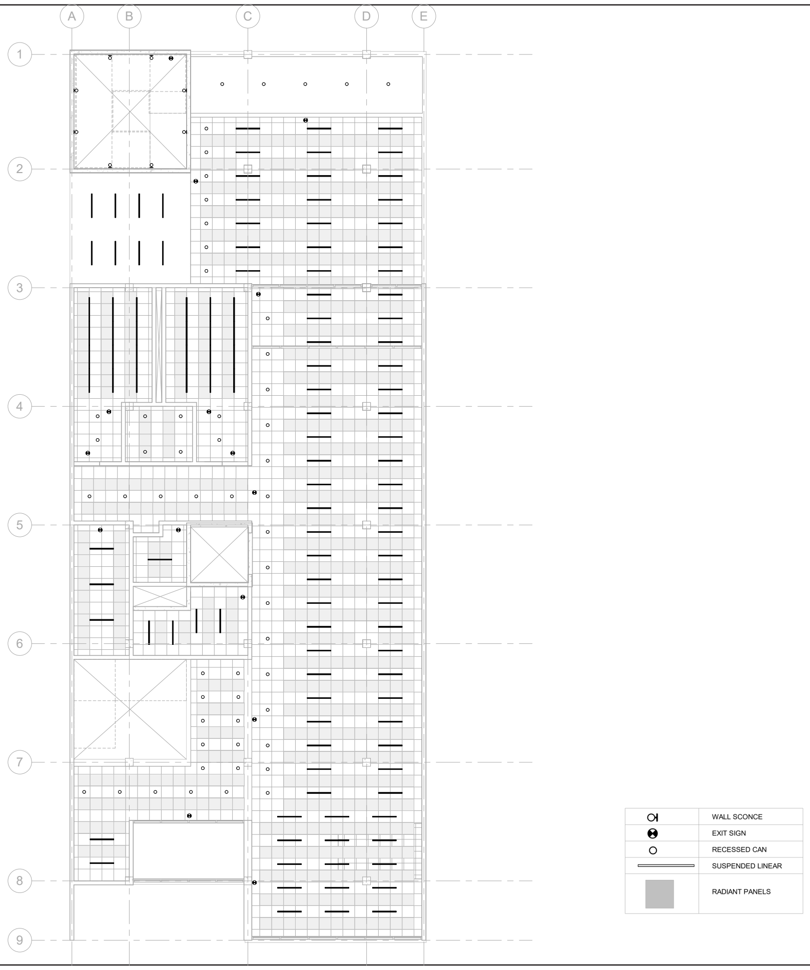
bottom half, opposite and current page: electrical power level 1 (opposite page), level 2 (top right), and level 3 (bottom right) plans from the electrical set.


TYPICAL RADIANT PANEL
RADIANT PANELS PLACED IN A 2'x2' GRID
50% EXTERIOR SPACES
30% INTERIOR SPACES
HARVARD YARD OFFICE + EVENT CENTER
MAD ARCHITECTS | BOSTON
SHEET TITLE
Radiant Panels Level 02
SHEET NUMBER
M122
ALL DIMENSIONS ARE IN Ft. In.
1/16" = 1' SCALE
PHASE 4


TYPICAL RADIANT PANEL
RADIANT PANELS PLACED IN A 2'x2' GRID
50% EXTERIOR SPACES
30% INTERIOR SPACES
HARVARD YARD OFFICE + EVENT CENTER
MAD ARCHITECTS | BOSTON
SHEET TITLE
Radiant Panels Level 03
SHEET NUMBER
M123
ALL DIMENSIONS ARE IN Ft. In.
1/16" = 1' SCALE
PHASE 4


RECEPTACLES IN BATHROOMS AND KITCHEN WET-WALL WALLS TO BE EQUIPPED WITH G.F.C.I. PER N.E.C., TYP. SINK ADJACENT RECEPTACLES TO BE MOUNTED AT A.F.F. PER N.E.C.
WALL MTD. RECEPTACLES (48" A.F.F.) IN DEMISING WALLS; TYP. FOR B.O.H., BATHROOMS, STORAGE, ELEC, MECH, AND KITCHEN.
RECEPTACLES IN DATA ROOM AND ELEC. ROOM TO ALL BE DOUBLE DUPLEX FOR SERVER STACKS.
FLOOR MTD DUPLEX RECEPTACLES UNDER DESKS
FLOOR RECEPTACLES TO SATISFY N.E.C. REQUIREMENT ALONG WALLS & PARTITIONS IN SHARED CORRIDORS, OFFICE LOBBY, AND EVENT SPACE. 2' O./C. FROM FINISH FACE OF WALL, TYP.
Electrical Fitting Schedule
Recessed Floor MTD. Duplex Receptacle
Recessed Floor MTD. Double Duplex Receptacle
Wall MTD. (48"A.F.F)Duplex Receptacle
Wall MTD. (48"A.F.F)Double Duplex Receptacle
HARVARD YARD OFFICE + EVENT CENTER
MAD ARCHITECTS | BOSTON
SHEET TITLE
Electrical Power Plan Level 02
SHEET NUMBER
E102
ALL DIMENSIONS ARE IN Ft. In.
1/16" = 1' SCALE
PHASE 4


RECEPTACLES IN BATHROOMS AND KITCHEN WET-WALL WALLS TO BE EQUIPPED WITH G.F.C.I. PER N.E.C., TYP. SINK ADJACENT RECEPTACLES TO BE MOUNTED AT A.F.F. PER N.E.C.
WALL MTD. RECEPTACLES (48" A.F.F.) IN DEMISING WALLS; TYP. FOR B.O.H., BATHROOMS, STORAGE, ELEC, MECH, AND KITCHEN.
RECEPTACLES IN DATA ROOM AND ELEC. ROOM TO ALL BE DOUBLE DUPLEX FOR SERVER STACKS.
FLOOR MTD DUPLEX RECEPTACLES UNDER DESKS
FLOOR RECEPTACLES TO SATISFY N.E.C. REQUIREMENT ALONG WALLS & PARTITIONS IN SHARED CORRIDORS, OFFICE LOBBY, AND EVENT SPACE. 2' O./C. FROM FINISH FACE OF WALL, TYP.
Electrical Fitting Schedule
Recessed Floor MTD. Duplex Receptacle
Recessed Floor MTD. Double Duplex Receptacle
Wall MTD. (48"A.F.F)Duplex Receptacle
Wall MTD. (48"A.F.F)Double Duplex Receptacle
HARVARD YARD OFFICE + EVENT CENTER
MAD ARCHITECTS | BOSTON
SHEET TITLE
Electrical Power Plan Level 03
SHEET NUMBER
E103
ALL DIMENSIONS ARE IN Ft. In.
1/16" = 1' SCALE
PHASE 4


A
B
C
D
E
1
2
3
4
5
6
7
8
9
WALL SCONCE
EXIT SIGN
RECESSED CAN
SUSPENDED LINEAR
RADIANT PANELS

Symbol	Description
◐	WALL SCONCE
⊗	EXIT SIGN
○	RECESSED CAN
═	SUSPENDED LINEAR
▨	RADIANT PANELS

HARVARD YARD OFFICE + EVENT CENTER

MAD ARCHITECTS | BOSTON

SHEET TITLE

Electrical Lighting RCP Level 01

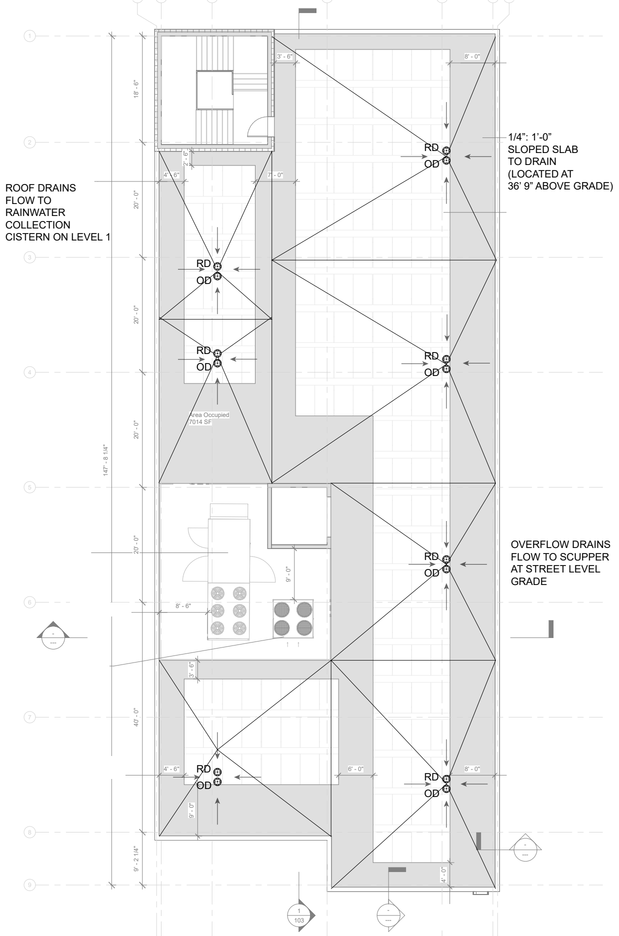
SHEET NUMBER

E111

ALL DIMENSIONS ARE IN Ft. In.

1/16" = 1' SCALE

PHASE 4


ROOF DRAINS
FLOW TO
RAINWATER
COLLECTION
CISTERN ON LEVEL 1
1/4": 1'-0"
SLOPED SLAB
TO DRAIN
(LOCATED AT
36' 9" ABOVE GRADE)
OVERFLOW DRAINS
FLOW TO SCUPPER
AT STREET LEVEL
GRADE
RD
OD
Area Occupied
7014 SF

HARVARD YARD OFFICE + EVENT CENTER

MAD ARCHITECTS | BOSTON

SHEET TITLE

MEP Roof Drainage Plan

SHEET NUMBER

P104

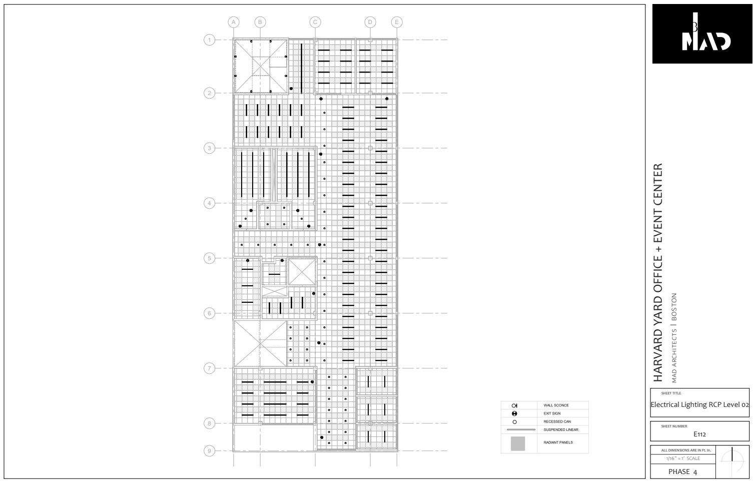
ALL DIMENSIONS ARE IN Ft. In.

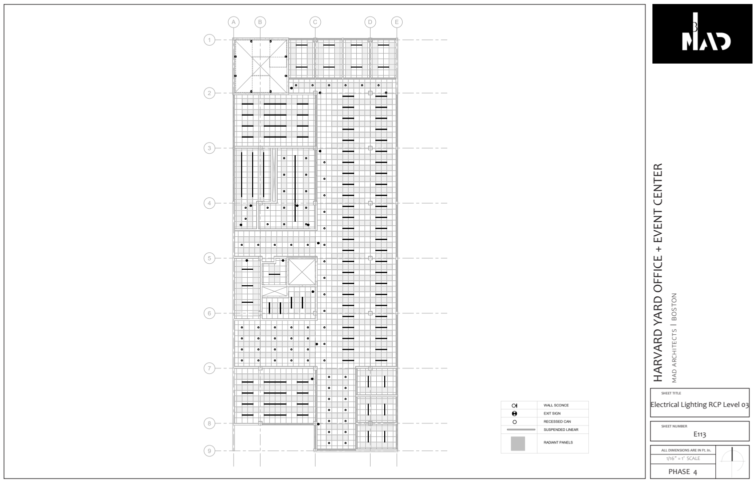
1/16" = 1' SCALE

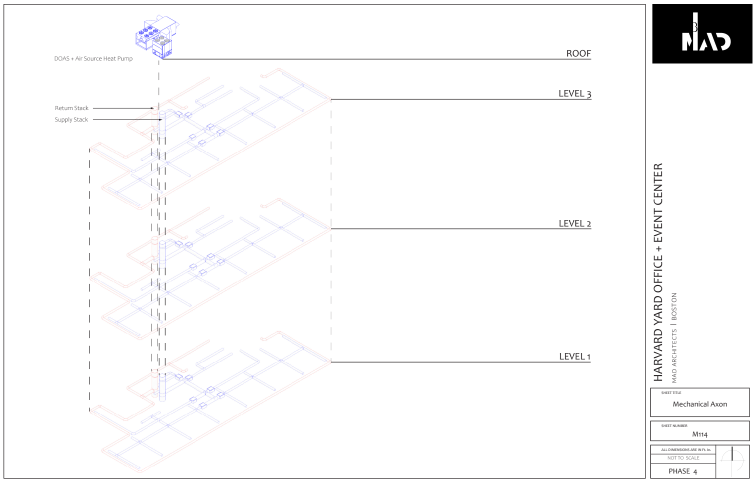
PHASE 4

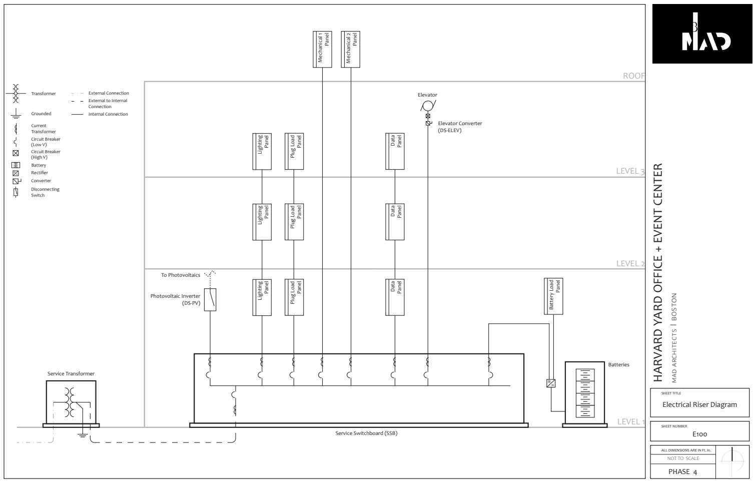
top half, opposite and current page: electrical lighting level 1 (opposite page), level 2 (top right), and level 3 (bottom right) reflected ceiling plans from the electrical set.

bottom half, opposite and current page: roof drainage plan (opposite page), mechanical exploded axon (top right), and electrical riser diagram (bottom right) from the mechanical, electrical, and plumbing sets.


A
B
C
D
E
1
2
3
4
5
6
7
8
9
WALL SCONCE
EXIT SIGN
RECESSED CAN
SUSPENDED LINEAR
RADIANT PANELS
HARVARD YARD OFFICE + EVENT CENTER
MAD ARCHITECTS | BOSTON
SHEET TITLE
Electrical Lighting RCP Level 02
SHEET NUMBER
E112
ALL DIMENSIONS ARE IN Ft. In.
1/16" = 1' SCALE
PHASE 4


A
B
C
D
E
1
2
3
4
5
6
7
8
9
WALL SCONCE
EXIT SIGN
RECESSED CAN
SUSPENDED LINEAR
RADIANT PANELS
HARVARD YARD OFFICE + EVENT CENTER
MAD ARCHITECTS | BOSTON
SHEET TITLE
Electrical Lighting RCP Level 03
SHEET NUMBER
E113
ALL DIMENSIONS ARE IN Ft. In.
1/16" = 1' SCALE
PHASE 4

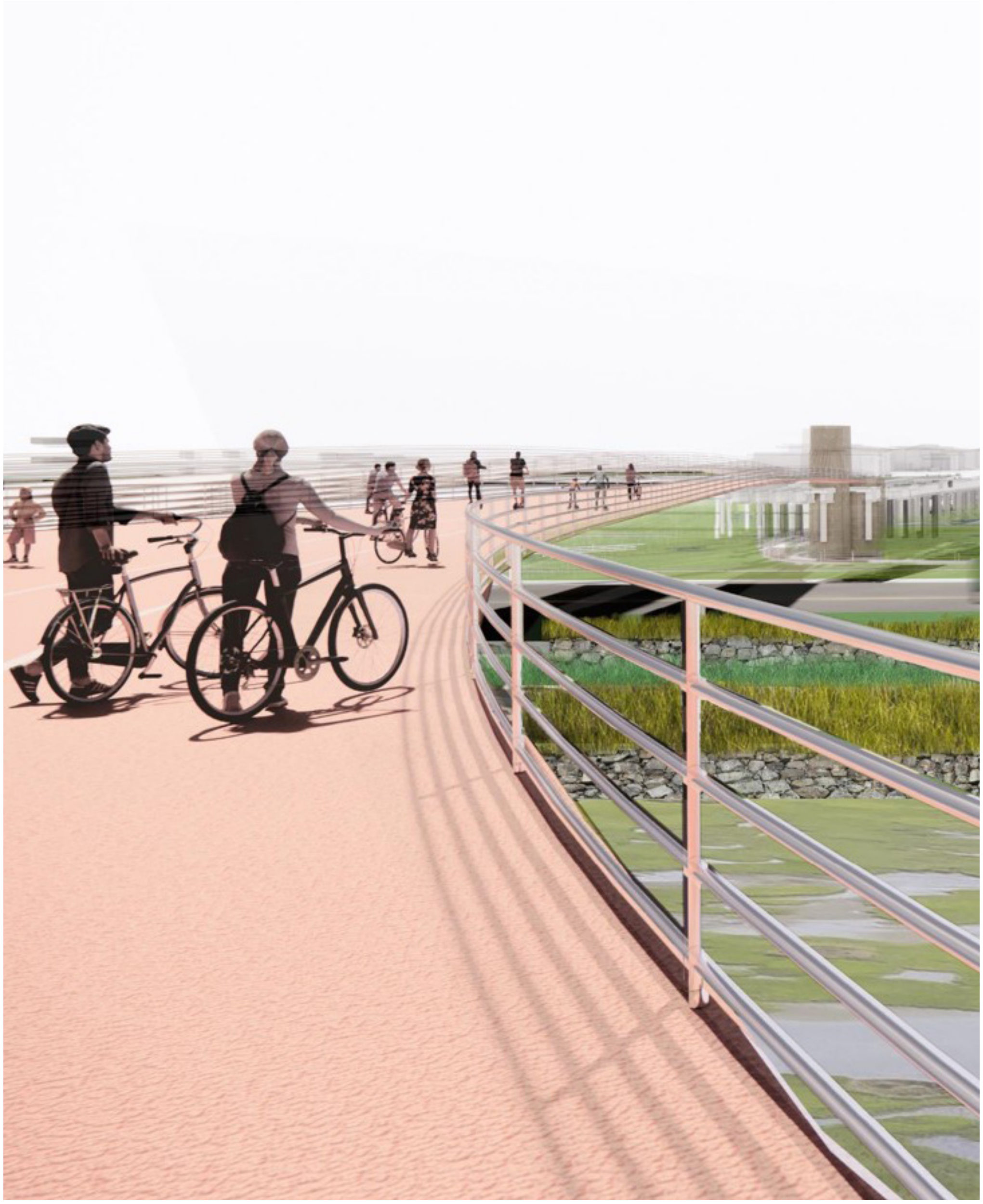

DOAS + Air Source Heat Pump
ROOF
LEVEL 3
Return Stack
Supply Stack
LEVEL 2
LEVEL 1
HARVARD YARD OFFICE + EVENT CENTER
MAD ARCHITECTS | BOSTON
SHEET TITLE
Mechanical Axon
SHEET NUMBER
M114
ALL DIMENSIONS ARE IN Ft. In.
NOT TO SCALE
PHASE 4


Mechanical 1 Panel
Mechanical 2 Panel
ROOF
Transformer
External Connection
External to Internal Connection
Grounded
Internal Connection
Current Transformer
Circuit Breaker (Low V)
Circuit Breaker (High V)
Battery
Rectifier
Converter
Disconnecting Switch
Elevator
Elevator Converter (DS-ELEV)
Lighting Panel
Plug Load Panel
Data Panel
LEVEL 3
LEVEL 2
To Photovoltaics
Photovoltaic Inverter (DS-PV)
Battery Load Panel
Batteries
Service Transformer
Service Switchboard (SSB)
LEVEL 1
HARVARD YARD OFFICE + EVENT CENTER
MAD ARCHITECTS | BOSTON
SHEET TITLE
Electrical Riser Diagram
SHEET NUMBER
E100
ALL DIMENSIONS ARE IN Ft. In.
NOT TO SCALE
PHASE 4

right: a perspective render of constructed wetlands along president's street, an evacuation route that would require additional raising. a pedestrian pathway connects riverside development to an eco-commercial corridor in the distance. this eco-commerical corridor is the former truman parkway, in which a new built environment punches through, sits on, or hangs off of the existing concrete structure.

opposite page, top: a series of mappings created to understand the existing conditions on the site. from these mappings, it was determined that the evacuation route ruunning through the site is at risk; the site is susceptible to sea level rise and there is limited role for development in the basin; the rice fields are an important part of savannah's history and are threathened by marsh migration; and the basin provides a backdrop for a tourism economy while connecting adjacent existing neighborhoods.

opposite page, bottom: a series of sketches depicting how each component of the site changes at 2, 5, and 7 feet of sea level rise. components are grouped in phases to highest where each component is primarily implemented. phases additionally correspond to 2 ft, 5 ft, and 7 ft sea level rise benchmarks.



project done in collaboration with marina massaroni and kevin miller

eastside gateway, savannah, ga

this amended eastside gateway plan considers a 7 ft sea level rise to inform a strategy of future development and environmental management for the city of savannah. it envisions a new natural riverfront that serves the community not only as a place of beauty and recreation, but as a physical barrier that protects the bluff, historic savannah, and the rice fields just beyond it. in this future, the railroad is no longer needed and the parkway is reimagined into a thriving recreational and economical hub connecting previously isolated portions of the city.

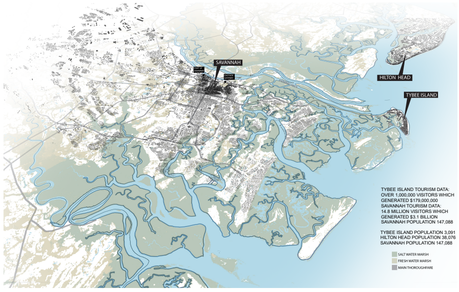
water+land+city

creating a model of coastal resiliency

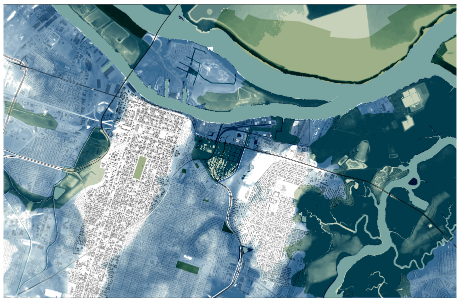
arch6049: design + research studio 1
professor richard dagenhart
fall 2022

EVACUATION

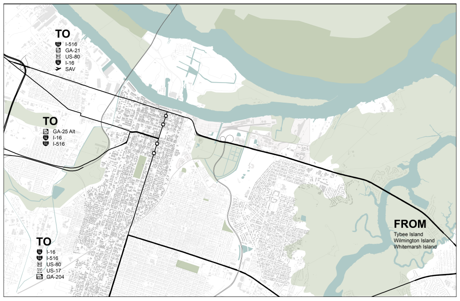
CONTEXT


SAVANNAH
HILTON HEAD
TYBEE ISLAND
TYBEE ISLAND TOURISM DATA:
OVER 1,000,000 VISITORS WHICH
GENERATED $179,000,000
SAVANNAH TOURISM DATA:
14.8 MILLION VISITORS WHICH
GENERATED $3.1 BILLION
SAVANNAH POPULATION 147,088
TYBEE ISLAND POPULATION 3,091
HILTON HEAD POPULATION 38,076
SAVANNAH POPULATION 147,088
SALT WATER MARSH
FRESH WATER MARSH
MAIN THOROUGHFARE

CATEGORY 5 STORM SURGE

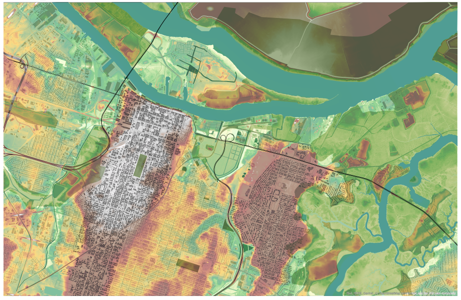


EVACUATION ROUTES

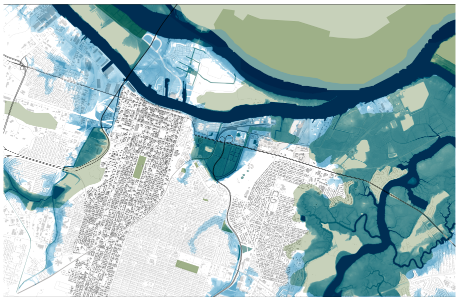

TO
I-516
GA-21
US-80
I-16
SAV
TO
GA-25 Alt
I-16
I-516
TO
I-16
I-516
US-80
US-17
GA-204
FROM
Tybee Island
Wilmington Island
Whitemarsh Island

STORM SURGE

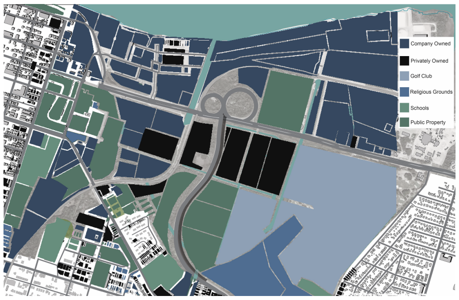
ELEVATION



7 FT. SEA LEVEL RISE

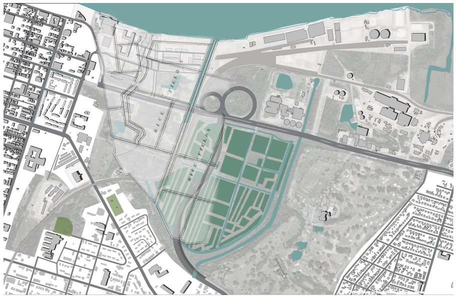


PARCELS

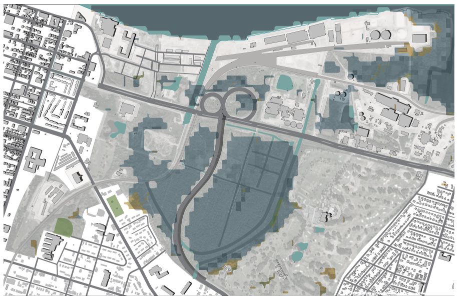

Company Owned
Privately Owned
Golf Club
Religious Grounds
Schools
Public Property

MARSH

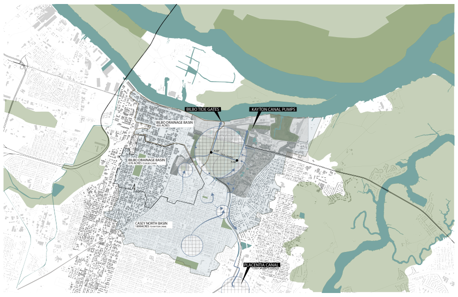
HISTORIC RICE FIELDS



MARSH LOSS - 0 TO 7 FT.



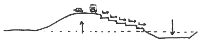
WATER MANAGEMENT


BILBO TIDE GATES
KAYTON CANAL PUMPS
BILBO DRAINAGE BASIN
405 ACRES
BILBO DRAINAGE BASIN
676 ACRES TO BILBO CANAL
PUMP
PUMP
CASEY NORTH BASIN
1809ACRES TO KAYTON CANAL
PLACENTIA CANAL

PHASE 1

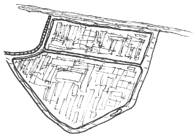
President's Street - 2 FT.

- Raise 10 FT. to form dike
- Dig canal
- Terrace dike edge



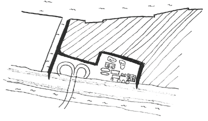
Rice Fields - 2 FT.

- Dikes put in at existing rice fields
- Railroad exists & functions as normal



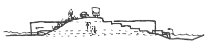
Marsh - 2 FT.

- Dike system established to protect water treatment plant
- Environmental remediation underway



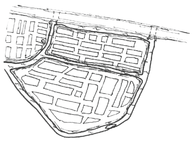
President's Street - 5 FT.

- Add sluice gates
- Add pumps



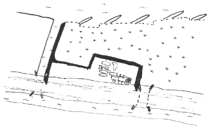
Rice Fields - 5 FT.

- Sluice gates manage water in basin
- Rice fields reconfigured to facilitate water circulation
- Railroad removed
- Freshwater rice fields installed to west of former railroad



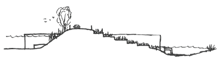
Marsh - 5 FT.

- Industrial operations cease
- Land converted to marshland
- Dike spurs added to slow water flow/ prevent erosion



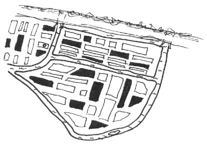
President's Street - 7 FT.

- Add additional natural buffers
- Increasing pedestrian access
- Rice terraces as natural filtration



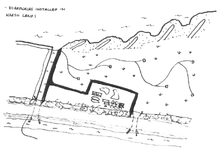
Rice Fields - 7 FT.

- Selective raising of rice fields create mosaic pattern



Marsh - 7 FT.

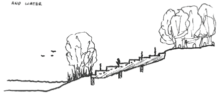
- Sediment accumulates along dikes to create new land as added protection
- Boardwalks installed in marsh lands



PHASE 2

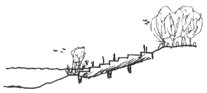
Edge - 2 FT.

- Installation of walkways serving as retaining walls
- Start of connections between neighborhoods & between people and water



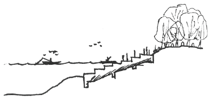
Edge - 5 FT.

- Stairs allowed to flood
- Walking paths still usable
- Waterfront programs submerged



Edge - 7 FT.

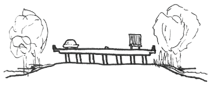
- Walking paths further limited
- Serves more of a protective function
- Water-focused small businesses (kayak rentals, fishing, etc.)



PHASE 3

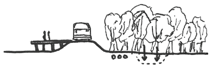
Truman Parkway - 2 FT.

- Parkway exists in current condition
- Fill around parkway foundations



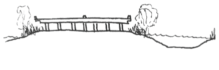
Development - 2 FT.

- Boardwalk installation along west side of railroad
- Extension of Bilbo Canal exposed rather than submerged to increase capacity



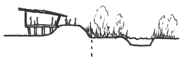
Truman Parkway - 5 FT.

- Rice fields established along periphery
- Parkway closed for vehicles



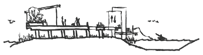
Development - 5 FT.

- Railroad ceases operation & becomes a recreational space
- Public edge shifts towards the rice fields
- Increased storage capacity within future development through lakes



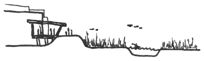
Truman Parkway - 7 FT.

- Selective demolition
- Pedestrianization of the parkway
- Access to multiple levels: bridge, docks, rice fields
- Small business + eco-tourism opportunities



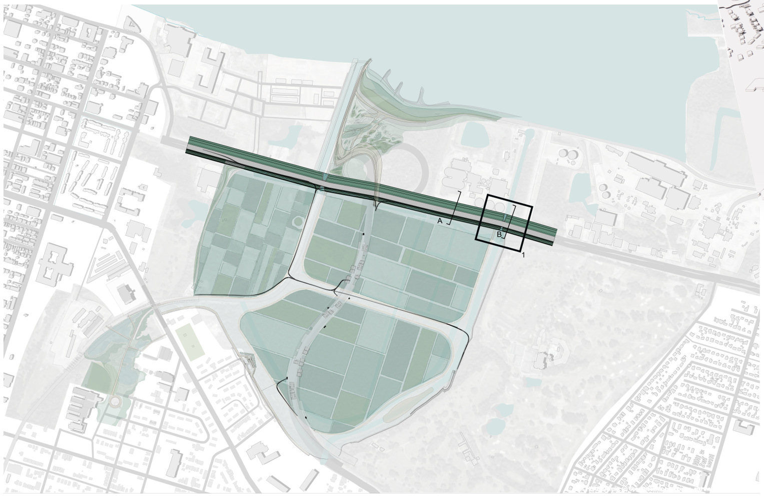
Development - 7 FT.

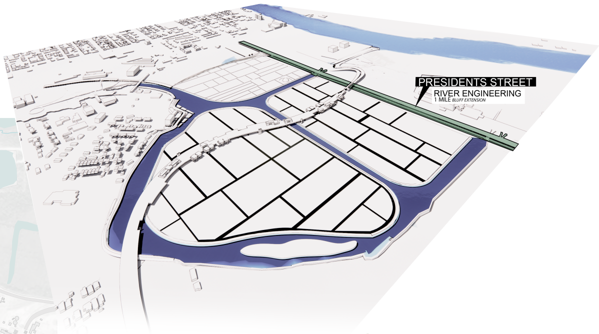
- Mixed-use development along west side activates edge

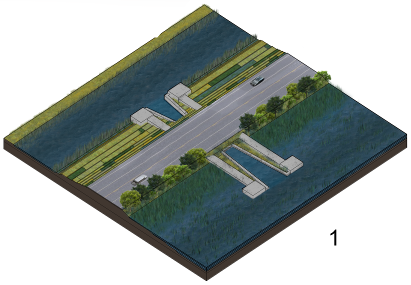


PRESIDENT'S STREET

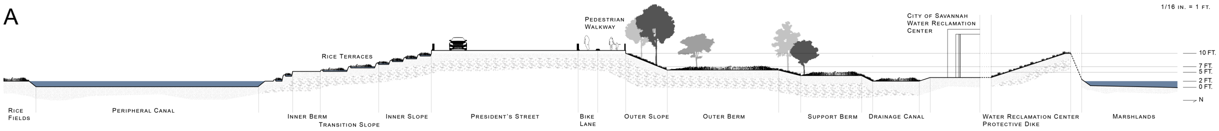
PHASE 1 INTERVENTION

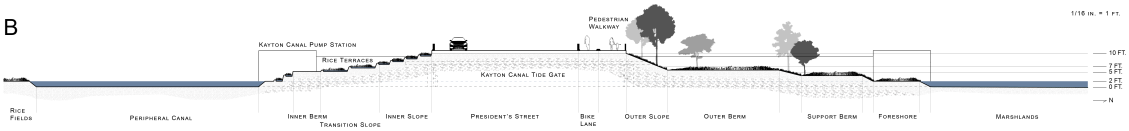



PRESIDENTS STREET
RIVER ENGINEERING
1 MILE *BLUFF EXTENSION*



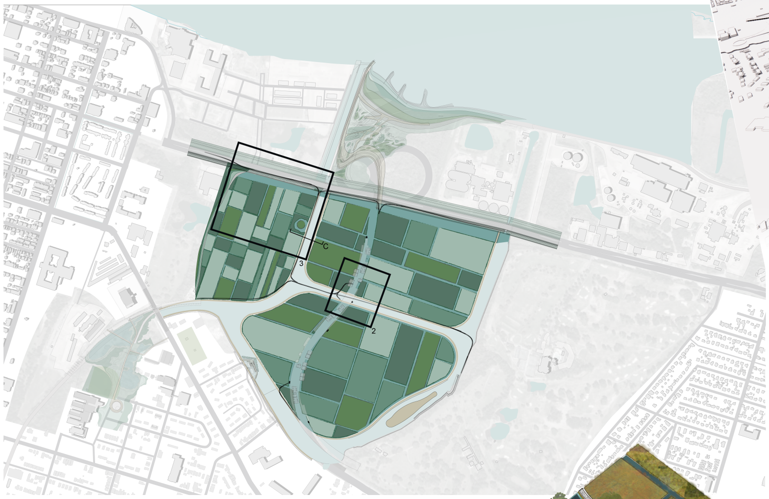
1

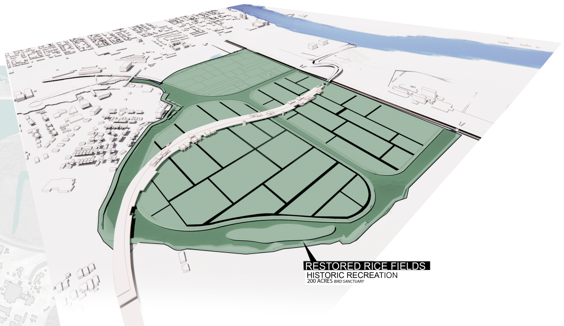

A
1/16 in. = 1 ft.
Pedestrian Walkway
Rice Terraces
City of Savannah Water Reclamation Center
10 FT.
7 FT.
5 FT.
2 FT.
0 FT.
N
Rice Fields
Peripheral Canal
Inner Berm
Transition Slope
Inner Slope
President's Street
Bike Lane
Outer Slope
Outer Berm
Support Berm
Drainage Canal
Water Reclamation Center Protective Dike
Marshlands

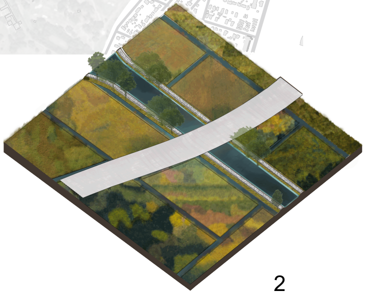

B
1/16 in. = 1 ft.
Pedestrian Walkway
Kayton Canal Pump Station
Rice Terraces
Kayton Canal Tide Gate
10 FT.
7 FT.
5 FT.
2 FT.
0 FT.
N
Rice Fields
Peripheral Canal
Inner Berm
Transition Slope
Inner Slope
President's Street
Bike Lane
Outer Slope
Outer Berm
Support Berm
Foreshore
Marshlands

RICE FIELDS

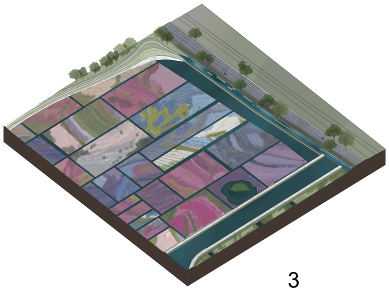
PHASE 1 INTERVENTION



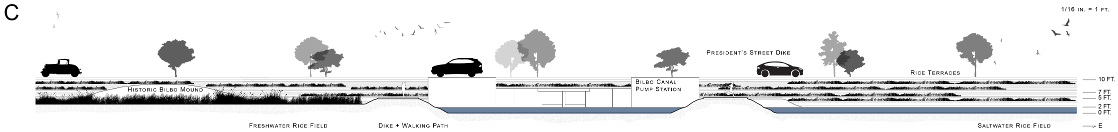

RESTORED RICE FIELDS
HISTORIC RECREATION
200 ACRES *BIRD SANCTUARY*



2

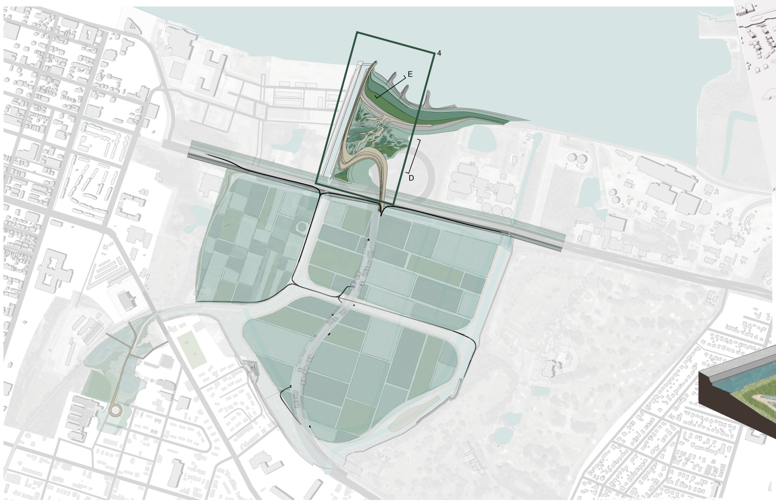


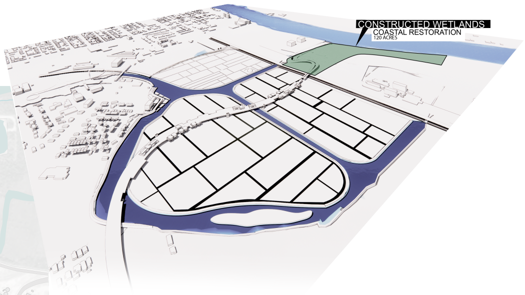
3

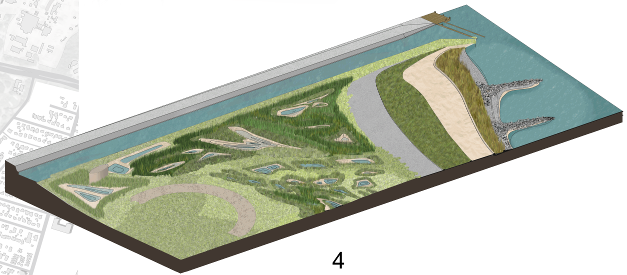

C
1/16 in. = 1 ft.
President's Street Dike
Rice Terraces
Historic Bilbo Mound
Bilbo Canal Pump Station
10 FT.
7 FT.
5 FT.
2 FT.
0 FT.
Freshwater Rice Field
Dike + Walking Path
Saltwater Rice Field
E

MARSHES

PHASE 1 INTERVENTION



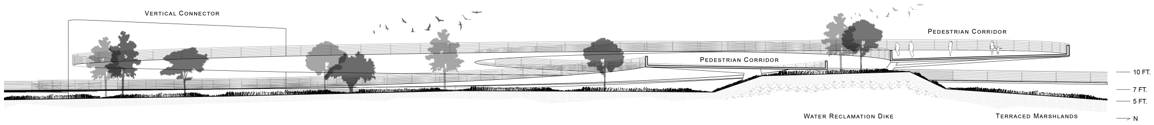

CONSTRUCTED WETLANDS
COASTAL RESTORATION
120 ACRES



4

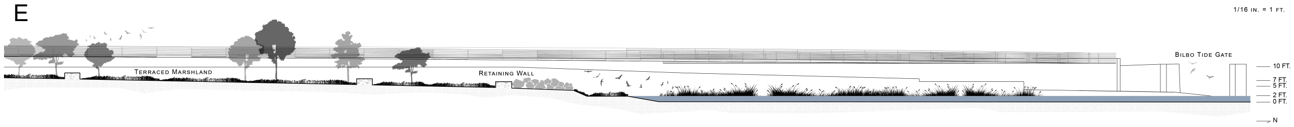
1/16 in. = 1 ft.

D


Vertical Connector
Pedestrian Corridor
Pedestrian Corridor
10 FT.
7 FT.
5 FT.
Water Reclamation Dike
Terraced Marshlands
N

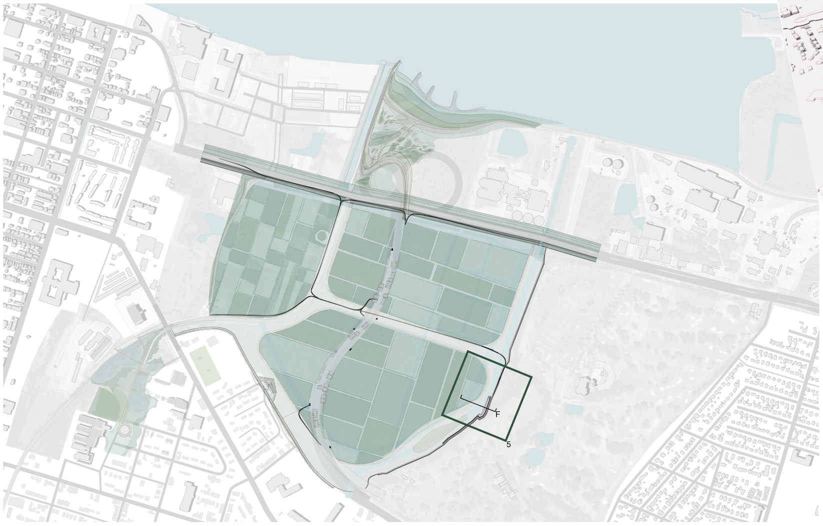
E

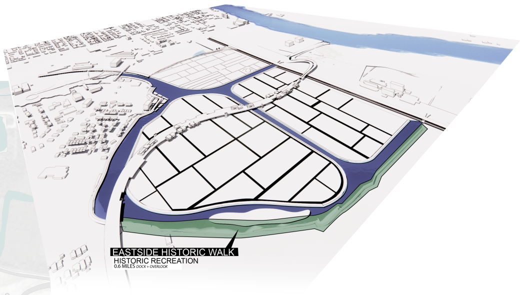
1/16 in. = 1 ft.

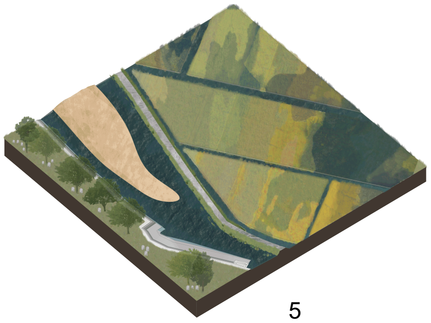

Terraced Marshland
Retaining Wall
Bilbo Tide Gate
10 FT.
7 FT.
5 FT.
2 FT.
0 FT.
N

EDGES

PHASE 2 INTERVENTION



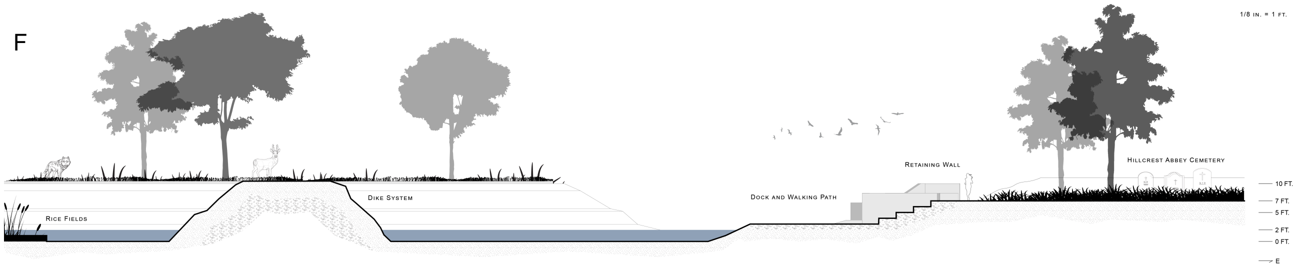

EASTSIDE HISTORIC WALK
HISTORIC RECREATION
0.6 MILES DOCK + OVERLOOK



5

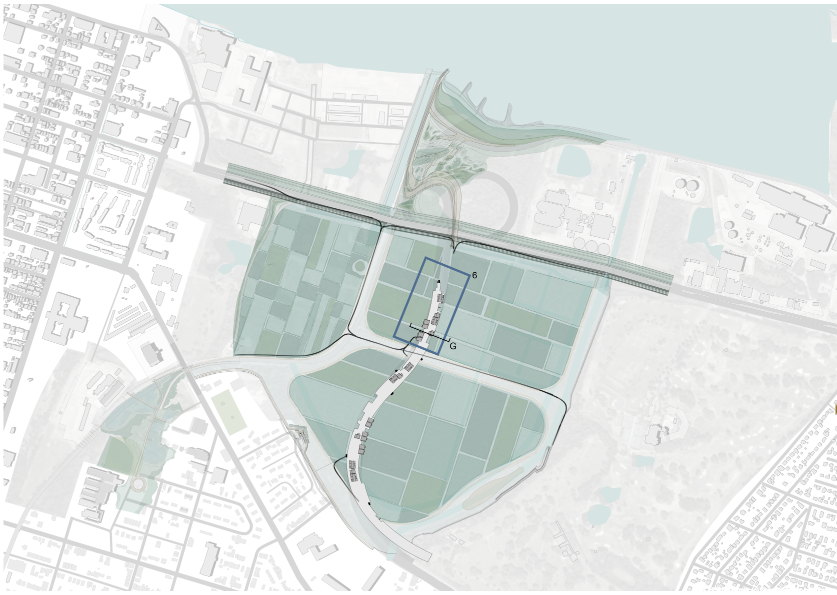
F

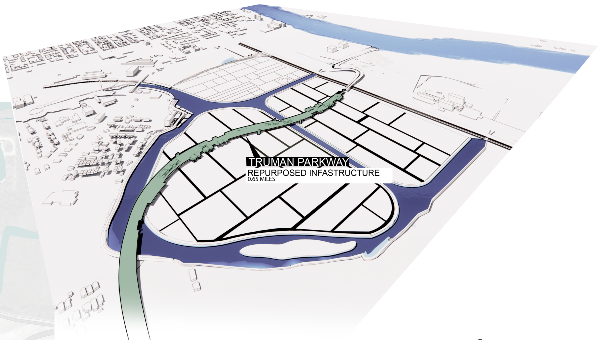
1/8 in. = 1 ft.

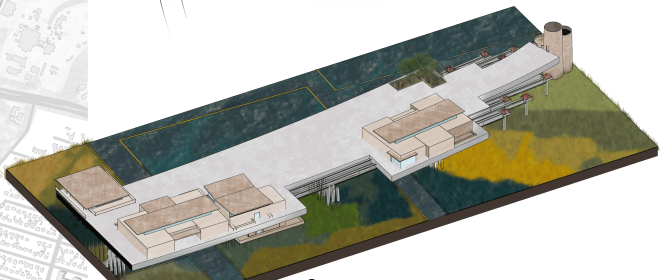

Rice Fields
Dike System
Dock and Walking Path
Retaining Wall
Hillcrest Abbey Cemetery
10 FT.
7 FT.
5 FT.
2 FT.
0 FT.
E

TRUMAN PARKWAY

PHASE 3 INTERVENTION

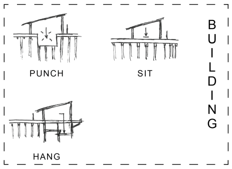


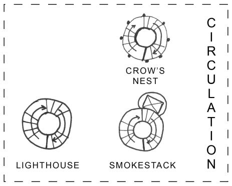

TRUMAN PARKWAY
REPURPOSED INFASTRUCTURE
0.65 MILES

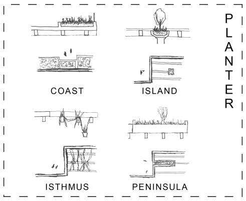


6

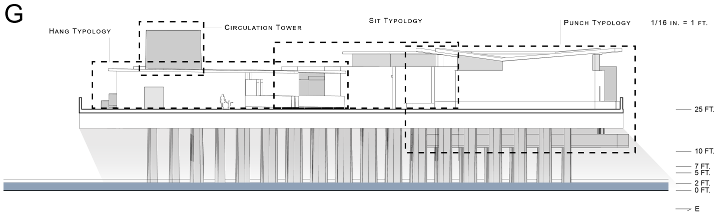
TYPOLOGIES

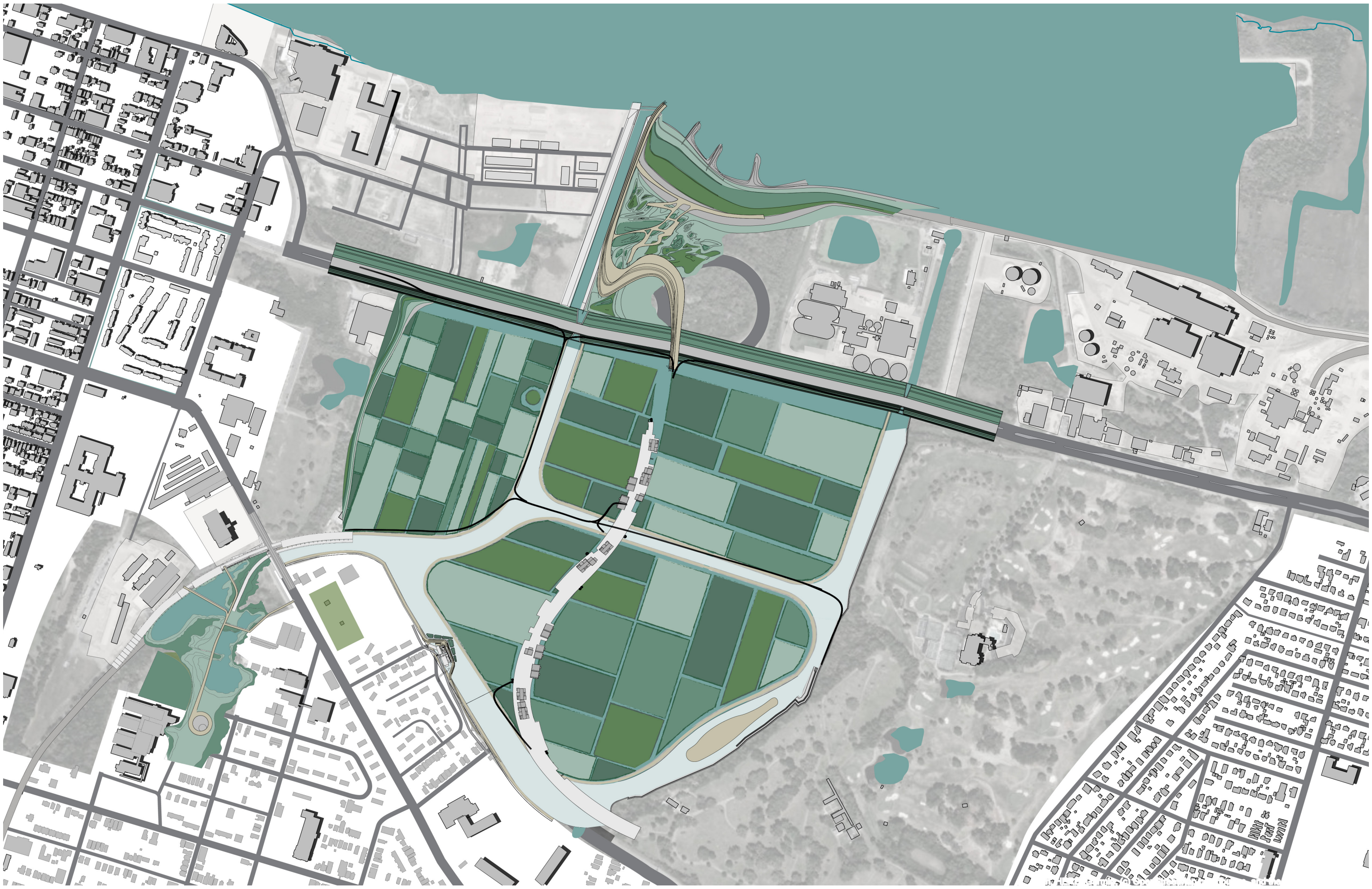

PUNCH
SIT
HANG
BUILDING


CROW'S NEST
LIGHTHOUSE
SMOKESTACK
CIRCULATION


COAST
ISLAND
ISTHMUS
PENINSULA
PLANTER

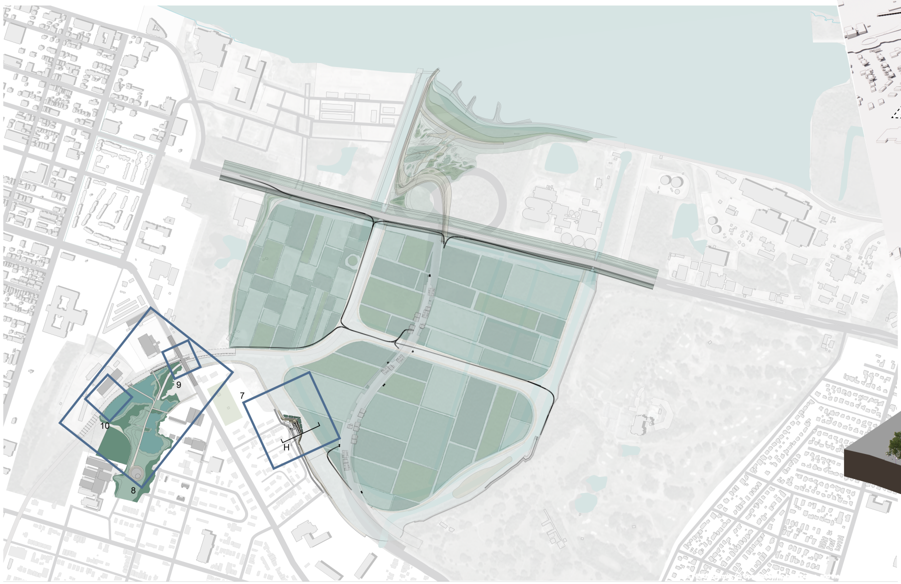
G

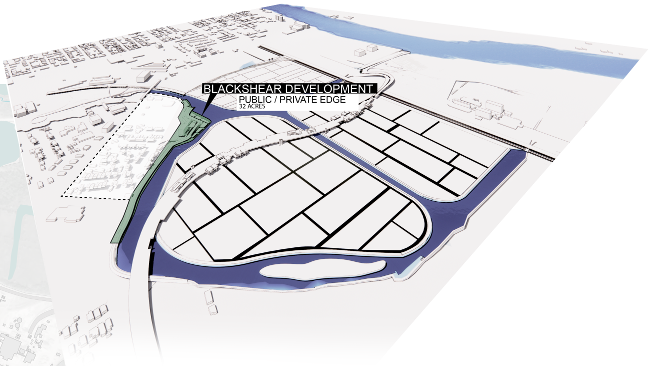

Hang Typology
Circulation Tower
Sit Typology
Punch Typology
1/16 in. = 1 ft.
25 FT.
10 FT.
7 FT.
5 FT.
2 FT.
0 FT.
E

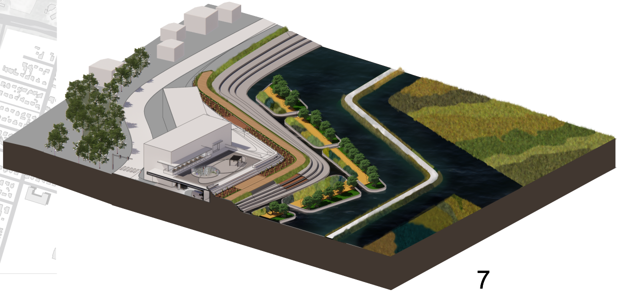


DEVELOPMENT

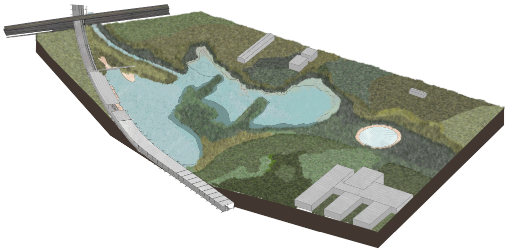
PHASE 3 INTERVENTION




BLACKSHEAR DEVELOPMENT
PUBLIC / PRIVATE EDGE
32 ACRES



7



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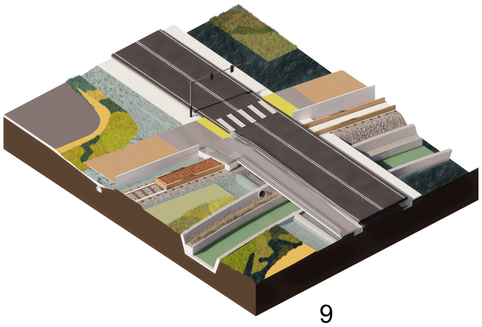
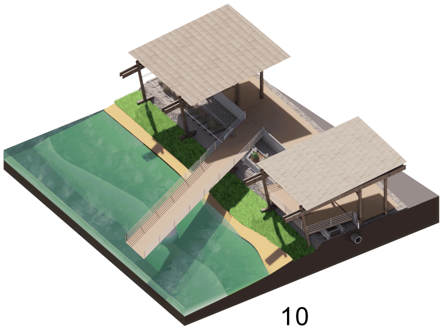
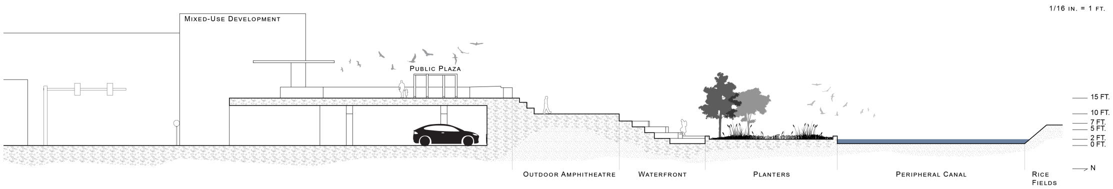


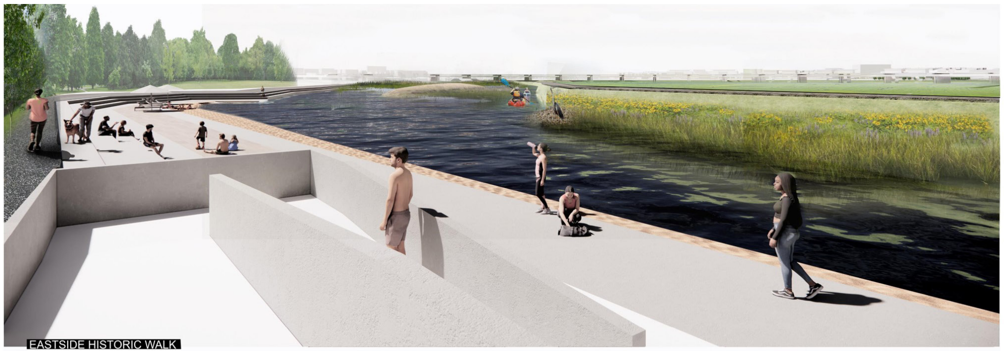
9



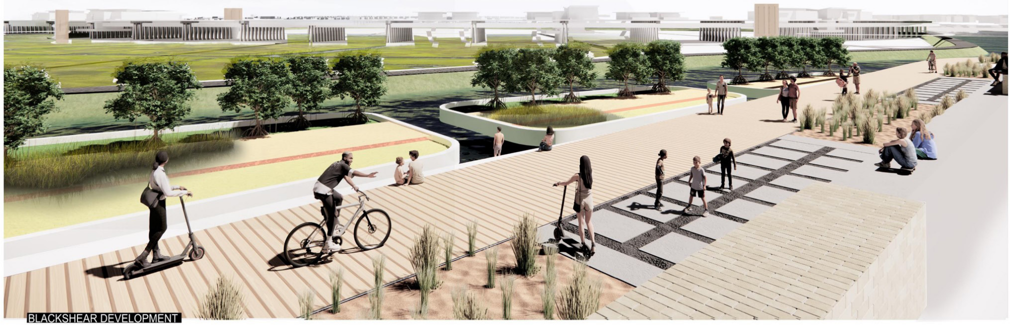
10

H


1/16 in. = 1 ft.
Mixed-Use Development
Public Plaza
15 FT.
10 FT.
7 FT.
5 FT.
2 FT.
0 FT.
N
Outdoor Amphitheatre
Waterfront
Planters
Peripheral Canal
Rice Fields



EASTSIDE HISTORIC WALK
HISTORIC RECREATION
0.6 MILES *DOCK + OVERLOOK*



BLACKSHEAR DEVELOPMENT
PUBLIC / PRIVATE EDGE
32 ACRES

previous spread: the first four components of the plan: president's street, rice fields, marshes, and edges. each component features a keyed map, representative rendered slice(s), and section drawing(s).

current spread, top half: the last two components of the plan: truman parkway and development.

opposite page, bottom: overall site plan.

current page, middle: a perspective render of the eastside historic walk, a retaining wall which doubles as a pedestrian corridor. the walk fronts the kayton canal and abuts savannah's oldest golf course and the hillcrest abbey cemetery. as the water rises, steps are allowed to flood.

current page, bottom: a perspective render of the public/private edge of the blackshear development. the adaptively-reused truman parkway can be seen in the background.